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COMMERCIAL FISHERIES REVIEW

A review of developments and news of the fishery industries
prepared in the BUREAU OF COMMERCIAL FISHERIES.

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PROCESSING AND QUALITY STUDIES OF SHRIMP HELD IN REFRIGERATED SEA WATER AND ICE

Part 3 - Holding Variables and Keeping Quality of the Raw Whole Shrimp

By Harry Seagran,* Jeff Collins,* and John Iverson**

ABSTRACT

Data are given on the keeping quality of raw whole pink shrimp in (1) ice and (2) refrigerated sea water at 30° and 32° F., at sodium chloride concentrations of 3 percent and 6 percent, and at shrimp-to-brine ratios of 1 to 1 and 1 to 2. The limit of acceptability of the shrimp was established subjectively and the relative quality was estimated by objective methods. An improved keeping quality of shrimp was obtained at (1) the lower temperature, (2) the higher brine concentration, and (3) the higher shrimp-to-brine ratio.

BACKGROUND

This report is part of a series in which the potential use of refrigerated sea water for holding Alaskan shrimp is being studied.

Fig. 1 - Chemist analyzing shrimp for volatile acid.

The purpose of the work reported here was to determine the effect of temperature, brine concentration, and shrimp-to-brine ratio on the keeping quality of the raw whole shrimp in comparison with the keeping quality of such shrimp held in ice.

EXPERIMENTAL

The experimental approach was to hold shrimp in refrigerated sea water at different temperatures, brine concentrations, and shrimp-to-brine ratios as well as to hold them in ice and then to see how their quality changed, as determined objectively, with time of holding.

MATERIAL: About 120 pounds of whole fresh pink shrimp (Pandalus species) was obtained from Wrangell, Alaska. The shrimp had been landed within a few hours of capture. They were held overnight without ice (air temperature approximately 30° to 32° F.) and shipped via air to the laboratory the following day. The

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shrimp were then briefly rinsed with cold fresh water and allowed to drain for a few minutes. At this point, hereafter referred to as zero time, approximately 30 hours had elapsed since the capture of the shrimp.

HOLDING METHODS: All samples held in refrigerated sea water were placed (together with the appropriate brine[1/] solution) in closed C-enamel, No. 10 cans, which were essentially filled. This closed system was described in the previous report (Collins, Seagran, and Iverson 1960). The cans containing the individual samples were held in large thermostatically-controlled liquid systems (Collins 1960). The variables employed are shown in table 1. Samples held in ice were mixed with at least three times their weight of ice and placed in large cans with perforated bottoms. These cans were held under an additional blanket of ice in an insulated ice chest. Samples were re-iced approximately every other day.

Table 1 - Holding Variables for Shrimp Held in Refrigerated Sea Water (RSW) and Ice

Sample Number	Holding Method	Temperature	NaCl Concentration	Shrimp-to-Brine Ratio
		Degrees F.	Percent	
1	ice	32	-	-
2	RSW	32	3	1 to 1
3	RSW	30	3	1 to 1
4	RSW	30	3	1 to 2
5	RSW	30	6	1 to 1

The series was continued for $10\frac{1}{2}$ days from zero time. At selected intervals, samples were withdrawn, the shrimp were quickly peeled by hand, and the whole unwashed meats were frozen at -20° F. in glass containers. As needed for analysis, a sample was softened by immersing the glass container in cold water. A blade assembly of an electric blender was screwed on the glass container, and the sample was blended until a homogeneous mixture resulted. The mixture was sampled immediately.

ANALYTICAL METHODS: Analyses were carried out as previously described (Collins, Seagran, and Iverson 1960) for total solids, total chloride, total nitrogen, nonprotein nitrogen, amino nitrogen, total volatile acid, and trimethylamine. The limit of acceptability of the ice-held and refrigerated-sea water-held shrimp was obtained subjectively by smelling the cold, drained, whole shrimp.

RESULTS AND DISCUSSION

The results of the analyses are given in table 2. In general, regardless of holding method, all samples showed a progressive apparent loss of total solids as a function of holding time. It is not known, however, to what degree this apparent loss is due to actual leaching of soluble constituents of the meats or to the uptake of water by the tissue, which is considerable for fish tissue held in certain aqueous systems (Seagran 1956). Of the refrigerated sea-water samples, the one held in 6-percent brine showed the least loss, probably owing much to the relatively higher amounts of salt absorbed by this sample. In addition, an increase in holding temperature or a lowering of the shrimp-to-brine ratio caused a slightly greater loss of solids. The iced sample showed the greatest loss of solids as a function of holding time. With the iced sample, it is likely that a true leaching accounted for most of the loss, owing to the lack of electrolyte in the washing medium and to the very low levels of chloride ion retained by the meats (Seagran 1956).

In the analyses of protein nitrogen (total nitrogen less nonprotein nitrogen), the sample held in 6-percent brine also showed the least decrease as a function of holding time. As was suggested above, assuming that the total solids for this sample included relatively more salt than did the samples held in 3-percent brine, the greater relative retention of protein by the sample held in 6-percent brine is even more meaningful. All samples, however, showed a rather slow progressive apparent loss of protein, the rates being approximately the same except for the samples held in 6-percent brine.

1/Sodium chloride solutions were used rather than natural sea water (Collins 1960).

In the analysis of the total nonprotein nitrogen fraction of the meats, a rapid leaching by the brine (or the ice-melt) was indicated. As with total solids, there was an indication that an increase in holding temperature or a lowering of shrimp-to-brine ratio caused a slightly greater loss, at a given salt concentration, until equilibrium was reached. The nonprotein fraction reached a minimum value in brine

Table 2 - Analytical Data[1/] Obtained on Pink Shrimp Held in Ice and in a Closed Refrigerated Sea-Water (RSW) System

Sample Number	Holding Time	Total Solids	Total Chloride	Total Nitrogen	Nonprotein Nitrogen	Amino-N Nitrogen	Volatile Acid	Trimethylamine
	Days	Percent	Percent NaCl	Percent	Percent	Percent	Meq.H+ 100 Gm.	Mg.TMA-N 100 Gm.
Zero-time	0	20.67	0.603	3.014	0.846	0.394	0.025	0.60
1 (ice, 32° F.)	0.5	19.42	0.648	2.897	0.791	0.366	0.069	0.55
	1.5	17.40	0.528	2.601	0.673	0.295	0.073	0.54
	3.5	15.98	0.416	2.352	0.566	0.246	0.073	0.52
	5.5	15.19	0.337	2.313	0.498	0.213	0.090	0.57
	6.5	14.29	0.221	2.136	0.436	0.172	0.067	0.82
	8.5	13.33	0.126	2.016	0.325	0.133	0.114	1.33
	10.5	12.87	0.107	1.909	0.265	0.140	0.149	2.58
2 (RSW-3%, 1 to 1, 32° F.)	0.5	19.80	1.096	2.883	0.720	0.322	0.038	0.05
	1.5	18.28	1.443	2.540	0.591	0.252	0.023	0.10
	3.5	16.92	1.664	2.272	0.504	0.199	0.073	1.05
	5.5	15.86	1.768	2.160	0.456	0.170	0.266	15.4
	6.5	15.89	1.772	2.205	0.471	0.174	0.554	26.4
	8.5	15.19	1.811	2.070	0.429	0.159	1.403	42.0
	9.5	15.02	1.804	2.036	0.445	0.143	1.859	46.8
	10.5	14.96	1.854	2.052	0.447	0.148	2.710	56.4
3 (RSW-3% 1 to 1, 30° F.)	0.5	19.63	1.106	2.791	0.674	0.317	0.020	0.07
	1.5	18.50	1.374	2.637	0.640	0.271	0.021	0.25
	3.5	17.23	1.552	2.391	0.525	0.198	0.015	0.55
	5.5	16.64	1.608	2.158	0.456	0.195	0.085	5.28
	6.5	16.29	1.738	2.075	0.417	0.185	0.314	14.9
	8.5	15.87	1.679	2.079	0.500	0.179	0.671	28.8
	9.5	15.69	1.712	2.156	0.477	0.178	1.052	39.4
	10.5	15.61	1.737	2.000	0.504	0.176	1.639	50.4
4 (RSW-3%, 1 to 2, 30° F.)	0.5	19.68	1.148	2.778	0.717	0.317	0.061	0.15
	1.5	18.20	1.468	2.518	0.601	0.230	0.037	0.19
	3.5	16.58	1.569	2.264	0.465	0.180	0.045	0.85
	5.5	15.88	1.817	2.090	0.420	0.162	0.166	6.93
	6.5	15.62	1.922	2.048	0.394	0.151	0.250	12.3
	8.5	15.32	2.036	1.897	0.395	0.141	0.691	23.1
	9.5	14.97	2.013	1.858	0.389	0.128	1.061	29.4
	10.5	14.98	2.002	1.962	0.412	0.127	1.561	38.0
5 (RSW-6%, 1 to 1, 30° F.)	0.5	21.53	1.923	3.000	0.794	0.336	0.018	0.00
	1.5	20.72	2.663	2.590	0.572	0.246	0.053	0.12
	3.5	19.38	2.907	2.417	0.420	0.205	0.067	0.19
	5.5	18.80	3.065	2.338	0.445	0.186	0.111	1.05
	6.5	18.46	3.034	2.219	0.442	0.179	0.078	2.20
	8.5	17.93	3.032	2.258	0.446	0.180	0.295	13.6
	9.5	17.99	3.117	2.261	0.452	0.193	0.500	24.6
	10.5	17.58	3.082	2.159	0.430	0.173	0.716	37.6

1/Data calculated on a wet-weight basis.

and then held rather constant at values characteristic for each refrigerated sea-water holding system. Considering the fact that the salt and water contents are also increasing with holding time, it is apparent that nonprotein nitrogen was slowly and continuously forming, presumably by enzyme hydrolysis of protein. This situation becomes more apparent after the initial leaching has been accomplished. The free amino acids appeared to behave in a fashion similar to the total nonprotein nitrogen fraction, except that the free acids continued to decrease slightly, suggesting that this fraction was preferentially being utilized as a source of nutrients for bacterial growth. The protective effects of lower temperature and 6-percent salt were also noticeable in this latter respect.

Salt uptake in refrigerated sea water was rapid, particularly for the sample held in 6-percent brine, so that after about $3\frac{1}{2}$ days holding time, each sample only

slowly increased to an equilibrium. The content of salt (as NaCl) attained at equilibrium in the 6-percent and 3-percent brines was approximately 3 percent and 1.8 percent, respectively.

The first definite off-odors detected in the whole shrimp occurred after $8\frac{1}{2}$ days holding in ice, after $5\frac{1}{2}$ days in either 3-percent or 6-percent[2/] refrigerated sea water at 30° F., and after $3\frac{1}{2}$ days in refrigerated sea water at 32° F. The odor was determined on the whole unwashed shrimp, and the objective tests were carried out on the peeled unwashed shrimp. A strict comparison of the samples held in ice with those held in refrigerated sea water in this study thus would not seem feasible, since in the former case most spoilage products would be washed from the meats by the generous ice-melt. In the case of the refrigerated sea-water samples, however, the spoilage products would be retained within the system and, it is believed, to a large degree by the shrimp. Commercially, whole shrimp are subjected to a continuous washing operation with large amounts of water while being mechanically peeled. Spoilage products accumulating during holding in refrigerated sea water may be materially reduced by such washing action (Collins 1960). Accordingly, the keeping quality for samples held in refrigerated sea water given in this report probably represent minimum storage life for shrimp held under similar conditions. The data given for ice-held shrimp, on the other hand, probably represent maximum storage life, owing to the ideal icing conditions employed.

Distinct differences in the keeping characteristics of the various samples held in refrigerated sea water were noted, both from objective and subjective standpoints. For example, lowering the temperature 2 degrees (from 32° F. to 30° F.) gave an effective increase of approximately 2 days in storage life, based on odor, volatile acid, and trimethylamine data. Further, at a given temperature (30° F.), an increase of the salt concentration from 3 percent to 6 percent increased the storage life from 1 to 2 days. Changing the shrimp-to-brine ratio had no apparent effect on storage life.

From the data of this study, spoilage products contained in raw shrimp in excess of 1 milligram of trimethylamine nitrogen per 100 grams of wet meat and in excess of 0.1 milliequivalent of volatile acid per 100 grams of wet meat would indicate a product of limited subsequent storage life. The trimethylamine test seemed particularly sensitive to changes in the keeping quality of raw shrimp.

From a practical standpoint, when shrimp are to be processed within 3 days from time of catch, assuming holding conditions are good (maximum holding temperature of 32° F.), there would appear to be no need of using a 6-percent brine holding system. On the other hand, the potential advantages of the 6-percent system for somewhat longer holding periods are considerable from the standpoint of slowing down bacterial processes. Earlier work by Roach and Harrison (1954) in Canada suggested that holding raw shrimp in sodium chloride brines somewhat saltier than sea water (up to 6 percent NaCl) gives a firmer, better quality, more easily picked (Collins 1960) product than does holding in chilled sea water (approximately 3 percent salt) at the same temperature for the same length of time. The relatively high salt content of shrimp held in such a system should be recognized, although it is likely that the generous washing that the meats receive when the shrimp are peeled by machine would materially reduce the salt content (Collins 1960). Since salt is normally added to a commercial pack, a slightly higher salt content in the shrimp used for canning may not be objectionable for such packs.

SUMMARY

1. A $10\frac{1}{2}$-daytime study, using whole fresh pink shrimp held in refrigerated sea water and in ice, is described. The effects of certain holding variables (temperature, 30° F. and 32° F.; brine concentration, 3 percent and 6 percent NaCl; and

2/Although subjective data are difficult to evaluate, the degree of odor measured indicated that shrimp held in 6-percent refrigerated sea water kept considerably longer (1 to 2 days) than did those held in 3-percent refrigerated sea water (at 30° F.). Objective data confirmed this conclusion.

shrimp-to-brine ratio, 1 to 1 and 1 to 2) on the keeping quality of the raw whole shrimp was studied.

2. For all holding methods, the shrimp meats showed a progressive decrease in contained solids with increased holding time. Total solids content appeared to decrease at a greater rate with higher temperature, with lower brine concentration, and with lower shrimp-to-brine ratio.

3. Nonprotein nitrogen slowly formed presumably by enzyme hydrolysis. Free amino acids appeared to be preferentially utilized for bacterial growth. The protective effects of lower temperature and higher salt concentration were observed in this latter respect.

4. The salt content (as NaCl) of the meats attained at equilibrium in the 6-percent and 3-percent brines was approximately 3 percent and 1.8 percent, respectively.

5. The maximum storage life of fresh whole shrimp in ice appeared to be approximately $8\frac{1}{2}$ days. The minimum storage life of fresh whole shrimp in 3-percent refrigerated sea water at 30° F., in 3-percent refrigerated sea water at 32° F., and in 6-percent refrigerated sea water at 30° F. appeared to be at least $5\frac{1}{2}$, $3\frac{1}{2}$, and $6\frac{1}{2}$ days, respectively. It appeared that either lowering the temperature from 32° to 30° F. or increasing the brine concentration from 3 percent to 6 percent sodium chloride gave an effective increase of storage life of from 1 to 2 days, other conditions being kept constant.

6. Spoilage products contained in raw shrimp in excess of approximately 1 milligram of trimethylamine nitrogen per 100 grams of wet meat and in excess of 0.1 milliequivalent of volatile acid per 100 grams of wet meat would indicate a product of limited subsequent storage life.

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TECHNICAL NOTE NO. 55 - RECOMMENDED PRACTICES FOR PROCESSING CHILLED AND FROZEN WHITING

ABSTRACT

This paper contains recommendations for handling and processing whiting (Merluccius bilinearis) which will upgrade product quality and value, and increase consumer acceptance. Although whiting constitutes one of the major species of fish landed in New England, its delicate tissue structure facilitates rapid quality loss during handling and processing. A check list which may be used by the fisherman, processor, and wholesaler to insure maintenance of product quality is included in the paper.

INTRODUCTION

Although large quantities of whiting (Merluccius bilinearis) are landed in the New England area annually, the value of this fishery is relatively small. The low return is due primarily to the delicate nature of the fish, since it rapidly loses its initial high quality under normal pre-processing and processing conditions. A study was therefore undertaken to determine practices in which the initial high quality of the whiting could be retained. The immediate objective of the study was to recommend practices for processing chilled and frozen whiting that would: (1) assist in upgrading product quality, (2) increase consumer acceptance, (3) increase value, and (4) act as a check list for fisherman, processor, and wholesaler.

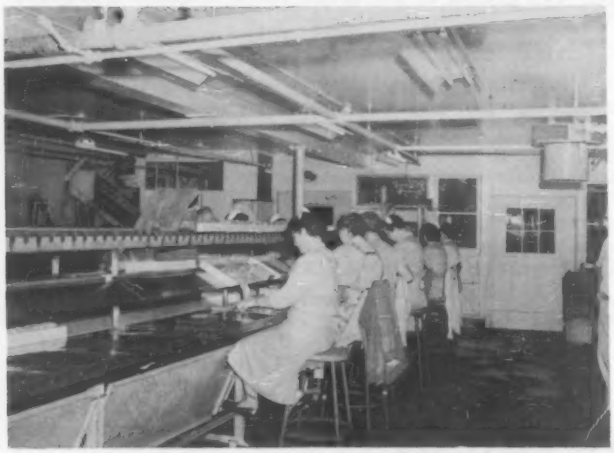

Fig. 1 - Packaging fillets of whiting in a modern processing plant.

PROCEDURE

Information required for this paper was gathered from various organizations representative of the whiting industry. Plants were visited to observe current commercial practices. Samples were obtained and evaluated for quality in relation to the quality of the original raw material and to the production methods employed. Data obtained in this study, together with the industry's comments and a consideration of the latest methods of quality control, resulted in the following recommendations.

RECOMMENDED PRACTICES

This specification applies to fresh or frozen, clean, whole, wholesome fillets cut away from either side of whiting (Merluccius bilinearis) and to fresh or frozen, clean, wholesome "headed and gutted" whiting.

Requirements for good quality are explained in the following sections and, as an aid for convenient reference, are listed in table 1. The subjects discussed are raw fish, wash media, products, packaging, refrigeration, and transportation.

Table 1 - Quality Requirements for Whiting

Factor Specified	Requirements for Fillets and Headed and Gutted Whiting	
Raw Fish	a. Appearance--bright; not damaged. b. Odor--characteristically fresh. c. Eyes--prominent and clear. d. Gills--bright red; no off-odor. e. Scales--firmly adhering and glistening. f. Slime--transparent or creamy white, if present. g. Flesh--firm, elastic, and tight on bones. h. Abdominal blood--bright red.	
Wash Media	a. Cold brine. b. Chlorinated sea water; 5 to 10 ppm. chlorine. c. Potable water.	
Product	a. Flesh--firm, resilient; white, pinkish white, off-white. b. Chalky, jellied, diseased, or parasitized tissue--none. c. Slight discoloration or yellowing--insignificant areas allowed.	
	Fillets	Headed and Gutted Whiting
	d. Fins, scales, blemishes, black-belly linings, blood spots, bones--none. e. Scraps, badly ruptured fillets--none. f. Minimum weight--2 ounces.	d. Scales, gills, viscera spawn--none. e. Minimum weight--3 ounces.
Packaging	a. 1-pound cartons with or without overwrap. b. 1- to 1½-pound packages with cellophane or equivalent wrap. c. Packed in 5- to 10-pound cartons.	a. 1½- to 10-pound cartons; tail ends of fish alternating and long axes of fish parallel.
	Carton overwrap--moisture-proof, heat-sealable on all cartons.	
Refrigeration	a. Chilled--held at 32° F. to a maximum of 36° F. b. Freezing--frozen at -10° F. or lower. c. Frozen storage--held at 0° F. or lower.	
Transportation	a. Chilled--held at 32° F. to a maximum of 36° F. b. Frozen--held at 0° F. or lower.	

RAW FISH: Immediately after capture, the fish shall be chilled and maintained in a thoroughly chilled condition by being packed in adequate amounts of clean, finely crushed or flaked ice. Fillets and headed and gutted whiting shall be processed only from good or excellent quality fish.

Fish of such quality have the following characteristics: appearance that is bright and that shows no damage; odor that is characteristically fresh; eyes that

are prominent and clear; gills that are bright and red and that have no off-odor; scales that adhere firmly and that are glistening; slime that, if present, is transparent or creamy white; flesh that is firm, elastic, and tight on the bones; and blood in the abdomen that is bright red. (Fish in rigor and with no blemishes shall be considered excellent in quality.)

WASH MEDIA: In the production of fillets, they shall be cut from fish that were scaled and washed in cold brine, chlorinated sea water, or cold clean potable water. The fillets thus produced shall then be washed in a similar manner and drained prior to being packaged. The brine shall be no more than 15 degrees salometer, and the washing time shall not exceed 2 minutes. Chlorinated sea water shall have a residual of 5 to 10 parts per million of free chlorine. Fillets that are to be used in low-sodium diets shall not be dipped in brine or otherwise brine treated.

In the production of the headed and gutted product, the whiting shall be headed, thoroughly scaled, and eviscerated in accordance with good commercial practice. Good commercial practice shall mean that the spawn and visceral parts are completely removed except that a slight amount of "stringing" shall be allowed. Before being packaged, the headed and gutted whiting shall be washed and drained as described for the fillets.

PRODUCTS: The flesh of fillets shall be firm and resilient, and white, pinkish white, or off-white. The fillets shall be free of any tissue that is chalky, jellied, diseased, parasitized, or otherwise abnormal. Small insignificant areas of slight discoloration or yellowing shall be allowed. The fillets shall be free of fins, scales, and practically free of blemishes, black-belly lining, blood spots, and bones. The fillets shall weigh not less than 2 ounces. Scraps and badly ruptured fillets shall not be accepted.

The flesh of headed and gutted whiting shall be firm and resilient, and white, pinkish white, or off-white. The flesh shall be free of any tissue that is chalky, jellied, diseased, parasitized, or otherwise abnormal. Small insignificant areas of slight discoloration or yellowing shall be allowed. Headed and gutted whiting shall be free of scales, gills, viscera, and spawn. Headed and gutted whiting shall weigh not less than 3 ounces.

PACKAGING: Fillets that are to be frozen shall be packaged in 1-pound capacity cartons with or without inner wrap or shall be wrapped in amounts of 1 to $1\frac{1}{2}$-pounds with cellophane or other suitable packaging material and shall be packed in 5- or 10-pound capacity cartons. Headed and gutted whiting shall be packaged in $1\frac{1}{2}$- to 10-pound capacity cartons and shall be packed with tail ends alternating and long axes parallel. All cartons shall be overwrapped with a moisture-vapor-proof, heat-sealable overwrapping material.

REFRIGERATION: Packages of fillets or of headed and gutted whiting that are to be shipped in the unfrozen state shall be kept at temperatures of 32° F. to a maximum of 36° F. by packing them in boxes with ice or by keeping them in a room maintained at 32° F. to a maximum of 36° F.

Packages of fillets or of headed and gutted whiting that are to be shipped in the frozen state shall be placed in the freezer within 30 minutes after being packaged. The product shall be frozen at a freezer temperature of -10° F. or lower and then shall be maintained in storage at a temperature of 0° F. or lower.

TRANSPORTATION: Fresh whiting shall be transported in either refrigerated or nonrefrigerated vehicles. During transportation, the whiting shall be kept at temperatures not higher than 36° F. by packing the containers of whiting in boxes with ice, and re-icing enroute if necessary, or by shipping them in vehicles that have a storage space maintained at 32° to 36° F.

Frozen whiting shall be transported in refrigerated units. The refrigeration must be turned on and the temperature reduced to 0° F. or lower prior to loading, and the proper temperature of 0° F. or lower shall continuously be maintained during the entire time of shipment.

The temperature of the fresh or frozen whiting shall be measured both before and after shipment, and duly recorded. (Temperatures can be determined by using an accurate stem-type thermometer, inserting it into the center of the chilled product or at the juncture of four package units of the frozen products for several minutes until the temperature indicated by the thermometer ceases to fall, and then reading this steady lowest temperature.)

--By R. D. Tenny, Chemist, and
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SHAD HERALDS SPRING

On April 20, 1787, while living at his Mount Vernon estate on the Potomac River, George Washington made this entry in his diary: "The shad began to run today."

As in the time of Washington when planked shad was the fish dish for gourmets, shad is still one of the best known and most highly-prized food fish on the Atlantic Coast. Its meat is tender and whitemeated, with a distinctive flavor, and the roe is considered a great delicacy.

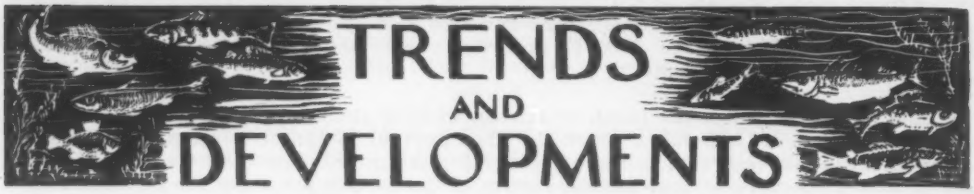
To the homemaker, bogged-down in a menu-rut from winter, it is good news indeed that the annual spring run of shad is on in important shad-producing streams of the Atlantic and Pacific Coasts.

A Planked Shad Dinner--served on a hardwood plank or oven-glass platter surrounded by mashed potatoes, vegetables, and garnishes--perks up the appetite. Here is how the home economists of the U. S. Bureau of Commercial Fisheries plank a shad.

PLANKED SHAD

3 or 4 pounds dressed shad
1½ teaspoons salt
Dash pepper
¼ cup butter or other fat, melted
Seasoned mashed potatoes
Seasoned cooked vegetables
(peas, carrots, cauliflower, tomatoes, or onions)

If hardwood plank is used, oil well and place in a cold oven to heat while oven preheats. Clean, wash, and dry fish. Sprinkle inside and out with salt and pepper. Brush with butter. Place fish on plank or well-greased ovenglass platter. Bake in a hot oven, 400° F., for 35 to 45 minutes or until fish flakes easily when tested with a fork. Remove from oven; quickly arrange border of hot mashed potatoes around fish. Place in a broiler until potatoes are slightly browned, about 5 minutes. Remove; arrange two or more hot vegetables around fish. Serves 6.



Fishing Vessel and Gear Developments

EQUIPMENT NOTE NO. 3--
NEW DIVING SLED FOR
UNDERWATER PHOTOGRAPHY:

To improve the effectiveness of commercial fishing gear, research units of the U. S. Bureau of Commercial Fisheries recently began an extensive series of underwater studies of gear action. Unique problems and technical difficulties have been created by the necessity for observing and recording the action of the gear under operational conditions. One of these was the lack of a suitable vehicle from which direct visual and motion picture observations could be made.

Early efforts to develop a suitable vehicle resulted in a strong lightweight diving sled of high maneuverability (Sand 1956). This sled fulfilled requirements for a vehicle from which direct observations of the gear could be made by SCUBA divers; but it was not considered fully satisfactory as a vehicle for underwater photography, because serious strains were imposed on the camera operator when making steady high-quality pictures.

To overcome that weakness, personnel assigned to the Bureau's gear research vessel George M. Bowers, at Pascagoula, Miss., recently developed and constructed a new sled specifically designed for motion picture work. Over 10,000 feet of motion picture film have been taken from the new sled since it was first put into operation, and its performance has been excellent at towing speeds of $1\frac{1}{2}$ to 3 knots.

Construction: The frame of the new sled (fig. 1) is welded throughout for safety and ruggedness. Control surfaces have been placed at the extreme leading edge of the sled frame, and handles for regulating those surfaces are placed on the port side for operation by one diver. All control linkage is run through rubber bushings rather than metal because rubber needs no lubrication and does not "freeze." The towpoint, on the forward edge of the frame, has been set back behind the effective center of action of the control surfaces (fig. 2) to provide greater maneuverability.

A rod attachment on the camera housing can be secured in one of two camera mounts on the leading and trailing edges of the starboard runner (fig. 3). The mounts permit movement of the camera through an extensive arc, thereby permitting pictures to be taken over a wide field while relieving the cameraman of considerable strain and providing steady support.

Foam-rubber net floats laced to the upper portion of the frame and air tanks spot-welded to the runners and under the central portion of the upper frame provide buoyancy. Canvas stretched between the lower frame members supports the divers and adds to the stability of the sled (figs. 2 and 3).

Accessories and Modifications: Development of research tools is a continuous task, and the tools developed must be subjected to constant revision as new needs arise. The foregoing account described the basic structure of the sled as it was used during the operations conducted in 1959. To that basic sled several accessory structures and features have been added, for example: a rudder (figs. 1-3) was found to increase the stability of the sled in strong currents; boxes lined with foam rubber (fig. 3) were placed on the frames near the camera mounts to hold light meters; a depth gauge was

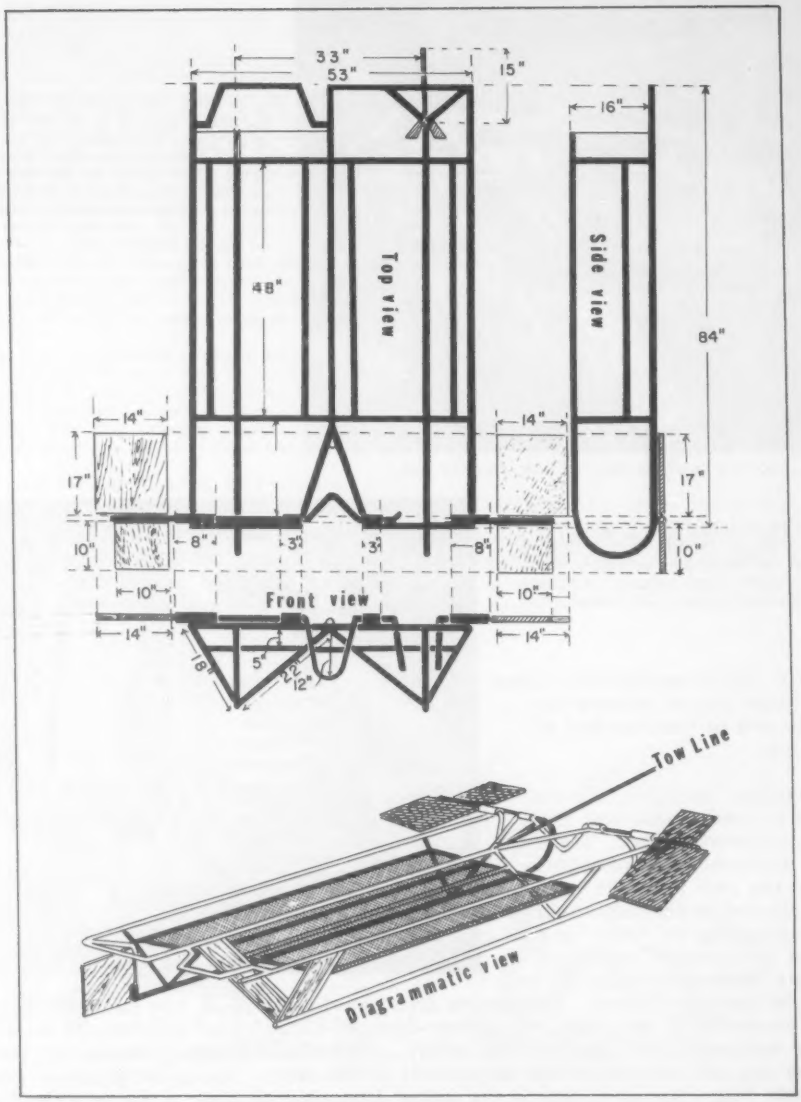


Fig. 1 - Diagrammatic views of the new sled. For clarity, only the frame is shown. All frame members are made of $\frac{3}{4}$-inch electrical conduit. Rudder, stabilizer, and control surfaces are $\frac{3}{4}$-inch plywood.

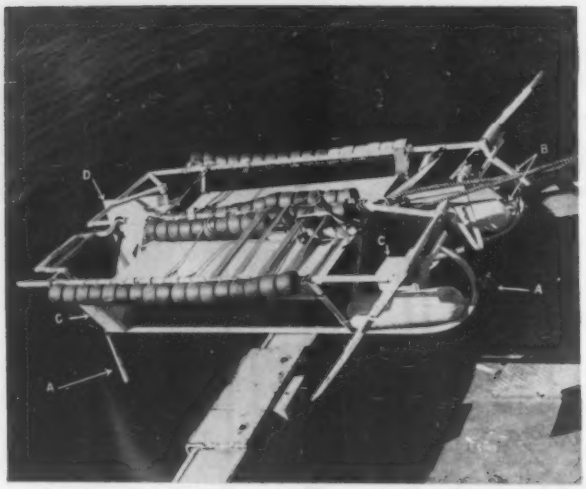


Fig. 2 - Top view of the sled. By placing the control surfaces on the leading edge of the frame and situating the tow point from one-fourth to one-third the length of the frame behind the effective center of action of the control surfaces, the sled has been made exceptionally maneuverable. A depth-indicator dial can be seen on the port flotation tank.

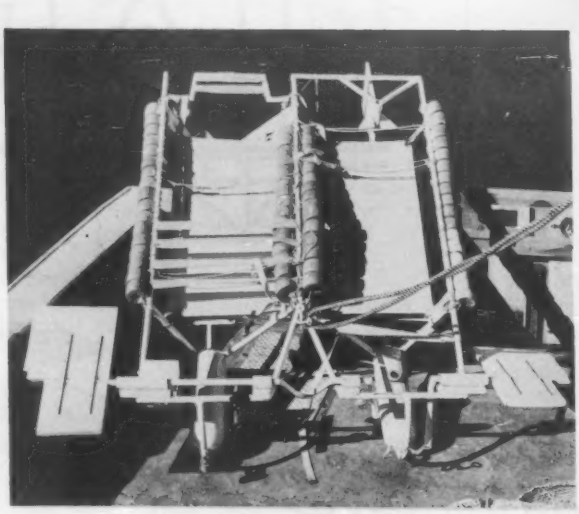


Fig. 3 - The sled balanced on the rail of the M/V George M. Bowers. (A) Camera mounts. (B) Handles for regulating port and starboard control surfaces. (C) Lined boxes for light meters. (D) Rudder.

added (fig. 2); and snynthetic-fiber straps were placed across the frame to add to the comfort of the divers.

Operation: In operation the sled has proved stable and extremely maneuverable. The excellent performance characteristics of the new sled are primarily attributed to the functional relation existing between the tow point and the control surfaces, which has been accomplished by setting the tow point back. Unlike the sled previously used, the new sled permits the operators to lie in a prone position--side by side. This minimizes water resistance and promotes comfort and safety. The sled operator lies on the port side where he has full control of the movement of the sled. The photographer-observer lies beside him--facing either in the same direction or toward the after end of the sled depending on the operation and the camera mount in use.

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--By John Hold, formerly Fishery Methods and Equipment Specialist,
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Alaska

KING CRAB RESEARCH AIDED BY SKIN DIVING:

Undersea ranching for controlled studies of king crabs is the latest project of the Biological Research Division of the Alaska Department of Fish and Game at Kodiak. The ocean floor is the ranch, steel framed wire-covered pens the corrals, and a skin-diving biologist the crab herder. The purpose is to gather biological information that will keep the new dollar-earning king crab industry in the Kodiak-Afognak area operating on a sustained-yield basis.

Although Department biologists have studied the king crab since 1954, successful management requires far more data on the animal's growth rates, feeding habits, migrations, and reproductive biology.

When the Alaska research biologist began his king crab research two years ago, he studied crabs by trapping them in pots and hauling them to the surface for examination. However, this was not entirely satisfactory. The biologist obtained a skin diver's suit to study the crabs in their own habitat.

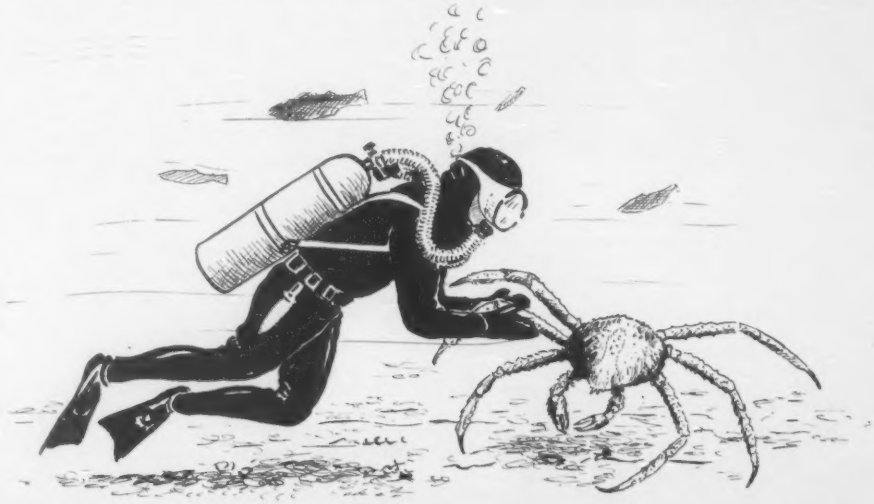
As crabs are nomadic in habit, the biologist found it necessary to build pens to confine his crabs to a certain area to insure continuity to his studies. He can now observe the crabs living in their natural environment on the ocean floor. About 300 king crabs are confined in six pens that have a combined area of 600 square feet. A two-inch stainless steel wire mesh keeps the smallest crabs from crawling out and prevents outside crabs from crawling in and eating the food placed there by the diver. The pens have no bottoms so the crabs can burrow in the mud or sand just as they might in their natural state. The temperature of the water is about 38 degrees in a 20-foot depth of water at low tide. The water is colder at 50 feet, but the biologist can work quite comfortably for an hour at that depth.

The suit is made of neoprene. It is known to divers as a wet suit. Although the suit fits skin tight, water seeps into the suit under the wrist and leg bands. This is gradually warmed by body heat until the diver is actually encased by a thin film of tepid water. The suit, including pants, shirt, gloves, boots, and head cap covers the body. Goggles fit over the eyes. Only the area around the mouth is exposed. It takes awhile for the exposed part of the face to grow accustomed to the cold water, although at times in the winter the water is often warmer than air. For breathing under water a 75-pound tank of compressed air is carried on the diver's back. Air is breathed through a mouthpiece attached to a hose from the tank. This will provide underwater breathing for about an hour. The tank appears heavy, but it is of course hollow and will rise buoyantly to the surface if released from the diver.

The biologist descends to tend and study his crabs at least once weekly. As the crabs cannot move out of the pens for food he must feed them. He gathers some of the food himself on the harbor floor; the rest he buys from fishermen. Sometimes 1,000 pounds is contracted for and frozen for future use. Food consists of starfish, sand dollars, sea urchins, and several kinds of bottom fish.

The Chief of the Biological Research Division for the Department who directs the king crab project along with other studies maintains that data on the entire life cycle of the king crab can be obtained by skin diving. He believes that skin diving should be encouraged and developed as a tool in fishery investigations.

The only time unpenned crabs can't be studied is when they go into deeper water offshore where they cannot be followed. But it is quite common, the biologist states, to observe king crabs reproducing in depths of 50 feet or less. At that time an estimate of sex ratios, vital to population counts, can be made.



Schools of herring and salmon have been observed on the sea dives. Halibut are quite wary. Squid swim away quickly, sometimes emitting an inky smoke screen in their wake.

As for king crabs, it is possible to observe any stage of their growth or activities. They don't seem to mind being watched. They can run quite fast, however, but none have been seen swimming free of the bottom. They walk "tip toe" on the ocean floor as fast or faster than a skin diver can swim.

The extent of a skin diver's observations depends upon his underwater visibility. This is determined by when and where he is diving. Sometimes visibility is good for a distance of 100 feet or poor at 20 feet. The use of an underwater compass is the only way the diver can keep his horizontal directions straight under water. He generally knows which way is up.

The biologist seldom goes down without a companion-diver as he says almost anything can happen in diving. Bleeding from the ears and nose can occur from ascending too rapidly. If the sinuses are clogged or the diver has a cold, a too rapid ascent may rupture blood vessels and cause a hemorrhage.

The biologist has made films of a king crab moulting and discarding its old shell. This was possible because he was able to observe the moulting process taking place in his undersea pens.

The only time a crustacean can increase its size is during a short period after it has shed its old shell. Comparatively little is known of king crab growth rates. After hatching, the king crab's life begins as a speck of microscopic plankton in the sea. From this almost invisible size it sometimes grows into a 24-pound specimen with a leg spread of nearly 58 inches.

No biologist is quite sure of the age male crabs become sexually mature. A female indicates arrival at maturity by the presence of eggs under her tail. Here she carries from 200,000 to 400,000 eggs. The female's sexual maturity has been roughly estimated at four years when she measures four inches across the body. A male king crab's body must measure 6½ inches before the animal can be taken legally by a fisherman.

Picking up a large king crab, the biologist states, can be real hazardous for a diver. For that reason he never tries to handle more than one at a time under water where they are particularly active. They can tear a diver's suit apart while waving their enormous legs and claws blindly about.

Another menace to divers are killer whales. These have been captured in the vicinity of Kodiak with as many as 13 seals in their stomachs.

The biological evidence being gathered will be used for management purposes wherever king crabs are found and harvested. There is reason to believe that king crab fishing areas will be greatly extended. This year a new fishing area will be investigated in the vicinity of Pelican in Southeastern Alaska. Much of the success of managing this valuable resource by the Alaska Department of Fish and Game will be based on the type of data.

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ALITAK BAY DECLARED A HISTORIC BAY:

A positive intention to maintain full jurisdiction and control over the waters of Alitak Bay (located on the southwest end of Kodiak Island) was announced on February 19, 1960, by the Alaska Department of Fish and Game. The boundary of State jurisdiction is defined as within the area encompassed by a line drawn from the southern tip of Tugidak Island to Low Cape on Kodiak Island and for three miles seaward of such a line.

The Alaska Department of Law has advised the Department of Fish and Game that there is precedent for this claim and that the State jurisdiction can be upheld.

American Fisheries Advisory Committee

NEXT MEETING TO BE HELD IN AUGUST:

The eleventh meeting of the American Fisheries Advisory Committee will be held in Seattle, Wash., August 10-12, 1960. The executive sessions will be held on August 10 and 11.

This advisory group was created under the terms of the Saltonstall-Kennedy Act of 1954 as amended in 1956. This legislation provides that an amount equal to 30 percent of the moneys received from import duties on fishery products shall be available to the Secretary of the Interior to promote the free flow of domestically-produced fishery products in commerce.

American Samoa

American Samoa Tuna Landings, January-February 1960

Species	January		February		Jan.-Feb.	
	1960	1959	1960	1959	1960	1959
	(1,000 Lbs.)					
Albacore	2,550	1,989	2,254	1,138	4,804	3,127
Yellowfin	222	411	400	396	622	807
Big-eyed	63	71	88	45	151	116
Skipjack	3	-	1	1/	4	1/
Total	2,838	2,471	2,743	1,579	5,581	4,050

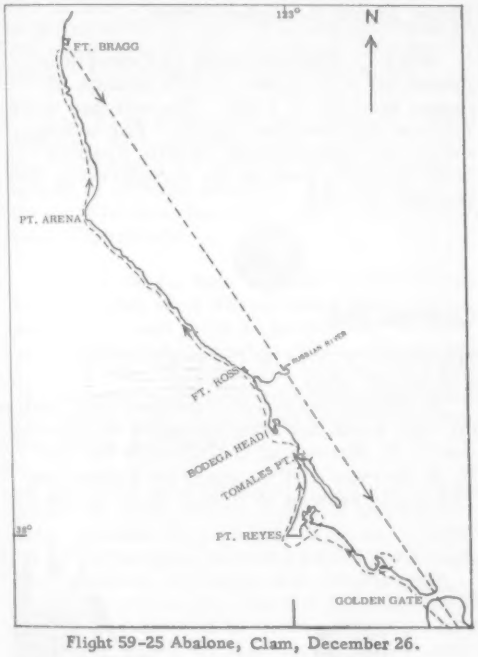
1/ Less than 500 pounds.

Note: Most of the tuna landed by Japanese long-line vessels; a small amount by South Korean and Samoan long-line vessels.

California

AERIAL CENSUS OF COMMERCIAL AND SPORT FISHING CONTINUED:

Airplane Spotting Flight 59-25, Abalone-Clam: The shoreline from San Francisco to Ft. Bragg and from Pt. Buchon to Pillar Pt. was surveyed from the air on December 26-27, 1959, by the California Department of Fish and Game Cessna 182 to determine the number of abalone sport fishermen, clam diggers, and shoreside sport anglers present in the area.

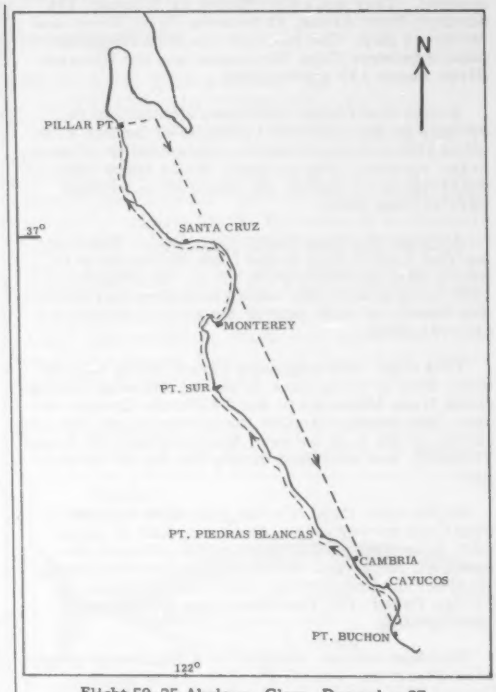


Flight 59-25 Abalone, Clam, December 26.

On December 26 the weather was better than average but there was a very heavy surf. There was almost no wind and only a scattering of high clouds. The tide was -0.5 ft. at 3 p.m.

On December 27 the weather was nearly perfect. The surf was very low, especially on the southern portion of the coast. The contrast with the previous day was remarkable. The observations were concluded at Pillar Point as a strong wind, an incoming tide, and darkness made further scouting pointless.

A skin-diving meet was in progress at Ano Nuevo and probably biases the count by adding spear fishermen to the abalone pickers in that area. Two commercial abalone diving boats were working three miles north of Pt. Piedras Blancas. On December 26 in the Golden Gate to Ft. Bragg area, 293 abalone pickers, 254 clam diggers, and 45 surf anglers were observed. In the area from Pt.



Flight 59-25 Abalone, Clam, December 27.

Buchon to Pillar Point, 605 abalone pickers, 636 clam diggers, and 74 surf anglers were observed.
Note: Also see Commercial Fisheries Review, February 1960, p. 29.

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CRAB DISTRIBUTION AND ABUNDANCE STUDIES CONTINUED:

Airplane Spotting Flight 59-20-Crab: The area from Moss Landing to Fort Ross was surveyed from the air on November 16, 1959, by the California Department of Fish and Game Cessna 182 to determine fishing localities of the central California commercial crab fishery.

Although fog and haze hampered observations, 198 crab trap strings were counted. No trap strings were observed south of Half Moon Bay or north of the Russian River. The greatest concentration of set gear was off Drakes Bay, south of Pt. Reyes. Lesser concentrations were off the Russian River and Sharps Park.

Airplane Spotting Flight 59-24-Crab: The coastal waters from Monterey to Oregon were surveyed from the air (December 20-22, 1959) to determine the fishing locations and relative density of the northern California crab fleet.

Sea and weather conditions were good between Monterey and Oregon, 261 lines of traps were

counted. They were distributed as follows: 176 north of Point Arena; 85 between Point Arena and Monterey Bay. The heaviest concentrations appeared between Cape Mendocino and the Klamath River where 136 were tallied.

Aerial observation indicates a reduction in settings in the traditional grounds of the San Francisco area and an increased concentration of gear in the Monterey Bay vicinity. While traps were observed in all depths, the majority of settings were in deep water.

Airplane Spotting Flight 60-1-Crab: The commercial crab fishing areas from Monterey to Pt. Reyes were surveyed from the air on January 6, 1960, to determine the fishing localities and relative density of crab gear of the central California crab fleet.

This flight was originally scheduled to include three days of flying time to survey the crab fishing areas from Monterey to the California-Oregon-border. Bad weather limited the survey to one day and survey of the area between Monterey and Pt. Reyes. Visibility was excellent during the day of the survey.

Eighty-nine lines of crab gear were counted within the survey area. About one-half of these were in an area five to eight miles offshore, between Pt. Reyes and Bolinas Bay. Concentrations of lesser magnitude were observed northeast of Pt. San Pedro (16), Half Moon Bay (6) and Moss Landing (14).

Fourteen whales, thought to be California grays, were observed: two off Pt. Reyes, one south of Drakes Bay, seven near the South Farallons, two near Half Moon Bay, and two off the Monterey peninsula.

Note: Also see Commercial Fisheries Review, April 1960, p. 18.

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SHRIMP LANDINGS BREAK RECORD IN 1959:

Landings in California of ocean shrimp set another record in 1959, according to the Director of the Department of Fish and Game. The ocean shrimp catch for 1959 totaled 1,777,874 pounds, an increase of 47,652 pounds over 1958, which was itself a record year.

The higher landings in 1959 were made possible when the Fish and Game Commission accepted Departmental recommendations to increase quotas in two areas. The quota was raised 250,000 pounds in Area A--Oregon line to Cape Mendocino--and by 200,000 pounds for Area B-1, off Fort Bragg.

The catch was largest in Area A, with California landings of 1,317,972 pounds, plus about 400,000 pounds landed in Oregon.

The Area A California shrimp fleet, which ranged from three vessels in May to 10 in July 1959, made over 1,000 tows, totaling more than 2,000 fishing hours. The average catch per fishing hour for the entire season was 638 pounds last year, which compares favorably with shrimp fishing anywhere in the world. The 1958 average was 501 pounds.

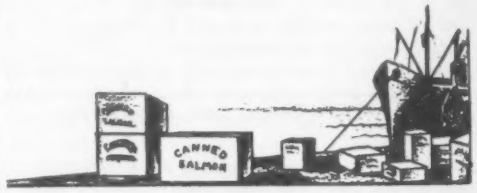
Virtually no shrimp catch came from Area B-2 in 1959. This area is from Point Arena to Pigeon Point.

Area C, Pigeon Point to Conception, produced just under 15,000 pounds of ocean shrimp in 1959. The shrimp were scarce and weather rough. The average catch per fishing hour in this area in 1959 was 106 pounds as compared to 256 pounds in 1958.

Canned Fish

DISTRIBUTION OF CANNED TUNA, SALMON, AND SARDINES:

A shipper survey of canned tuna, salmon, and sardines was recently finished by the U. S. Bureau of the Census for the U. S. Bureau of Commercial Fisheries. The purpose was to obtain data on the (1)



geographic location of the market; (2) the commodities that are moving, including number of cases by can size and type, and the class of customer; (3) how much of the pack moves into the multi-unit retail food channel, how much into Government, and how much into all other channels. The data are based on shipments in the 12 months ended June 30, 1959.

The study shows that about 23 million standard cases of canned fish were shipped during the twelve months. Canned tuna comprised more than half of the

total--about 13 million cases. Shipments of canned salmon and sardines accounted for 5 million cases each.

Distribution of canned tuna and sardines was largest in the Pacific region, accounting for 27 percent and 16 percent of total shipments, respectively. California received the largest proportion of both canned tuna and canned sardine shipments, which eventually are further distributed. Distribution appeared largest in this region because there is a movement from canner to warehouses in the case of tuna and sardines, and for export from California for sardines.

The East North Central Region--Ohio, Indiana, Illinois, Michigan, and Wisconsin--received 23 percent of total shipments of canned salmon. On the West Coast, Washington received 13 percent of total shipments.

Chunk-style tuna accounted for 61 percent of total tuna shipments. The one-half pound can pack represented 85 percent of tuna shipments. About 39 percent of total tuna pack moved into multi-unit retail food channels, 3 percent channeled through Government, and 58 percent into all other channels.

Red and pink salmon, in almost equal amounts, comprised about 67 percent of total salmon shipments. The one pound can was the most popular pack for salmon, representing 65 percent of distribution. The multi-unit purchasers distributed 23 percent of canned salmon, with only 1 percent channeled through Government and 76 percent into all other channels.

The distribution of sardines by style of pack was 38 percent oil pack, 24 percent tomato sauce, 6 percent mustard, and the remainder unidentified. Keyless sardines accounted for 93 percent of all sardine shipments; 56 percent packed in one pound cans. All sardines packed with key were distributed in the $\frac{1}{4}$-pound can sizes, with oil pack accounting for two-thirds. About 17 percent of all canned sardines were distributed through multi-unit retail outlets, 1 percent through Government, and the remainder through other channels.

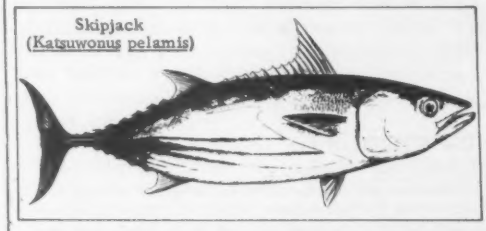
Note: Also see Commercial Fisheries Review, January 1960, p. 40

Central Pacific Fisheries Investigations

SKIPJACK TUNA HELD IN CAPTIVITY SUCCESSFULLY:

Oceanic shipjack tuna (Katsuwonus pelamis) were successfully introduced during February 1960 into a pool at the Honolulu (Kewalo-Basin) Biological Laboratory, of the U. S. Bureau of Commercial Fisheries, and are feeding in captivity. Although black skipjack and yellowfin-tuna have been held in captivity for varying periods of time, this is the first time that oceanic skipjack have been so held for more than a few hours or have been induced to feed.

The major portion of this success is attributed to the elimination of manual


Skipjack
(Katsuwonus pelamis)

handling of the fish. Transportation of the fish from the ocean to the pool was accomplished in such a way that the skipjack were only out of water momentarily and were touched only by a barbless hook. A portable steel, oval tank, 8 by 6 feet and approximately 2 feet deep, was secured to the deck of a chartered commercial live-bait vessel. When the skipjack were hooked, the fishermen lowered the fish into the tank with enough slack in the line to allow the fish to shake off the hook. During transport, water was continually circulated within the tank. When the vessel reached shore, the tank was lifted from the ship and immersed in the pool. A hatch in the side of the tank was opened and the skipjack were allowed to swim out of the tank into the pool.

The pool is circular, 23 feet in diameter and 4 feet deep. Pumps are arranged so that sea water from an adjacent channel or saline water from a well can be pumped into the pool. As water from the well is devoid of oxygen, it is allowed to cascade down a special aerator before flowing into the pool.

The only food that has been fed to the skipjack thus far has been chunks of shrimp, which have been purchased frozen from commercial sources.

With this significant advance in the Bureau's skipjack tuna behavior studies, plans are being made for the construction of more suitable tanks and associated instrumentation in which skipjack behavior may be observed. It is planned that conditioned response studies will be undertaken. These studies will involve variables which cannot readily be controlled at sea such as sound, light, and various extracts including fish blood, visceral extracts, etc., and will supplement those made at sea from the underwater observation chambers on the Bureau's research vessel Charles H. Gilbert.

Charts

NEW EDITION OF ISOGONIC CHART OF U. S.:

The new edition for 1960 of Isogonic Chart No. 3077 of the United States, with the States of Alaska and Hawaii included for the first time, has just been published, the Director of the Coast and Geodetic Survey announced on March 10, 1960.

The chart is issued in a new format with the 48 states shown on one side of a single sheet, printed back-to-back with the new States of Alaska and Hawaii. These charts show the distribution of magnetic declination or variation of the compass (the angle between true north and magnetic north) and rates of annual change for the entire Nation. The iso-lines connect points of equal magnetic declination and of equal annual-change rates. The 1960 edition of Chart No. 3077 supersedes the preceding edition published in 1955. Chart 3069b, Isogonic Chart of Alaska for 1955, is obsolete and will not be reissued, for Alaska is now shown on the United States chart.

The chart of Alaska includes western Canada, northwestern United States, and the eastern tip of Siberia. It is at the scale of 1:5,000,000 on the Lambert conformal conic projection, corresponding to the projection and scale of the reverse side showing the 48 states. The State of Hawaii is shown on the Alaska side of the chart at the scale of 1:7,500,000. The lines of equal declination and equal annual change have been completely redrawn for the new charts from the latest available information.

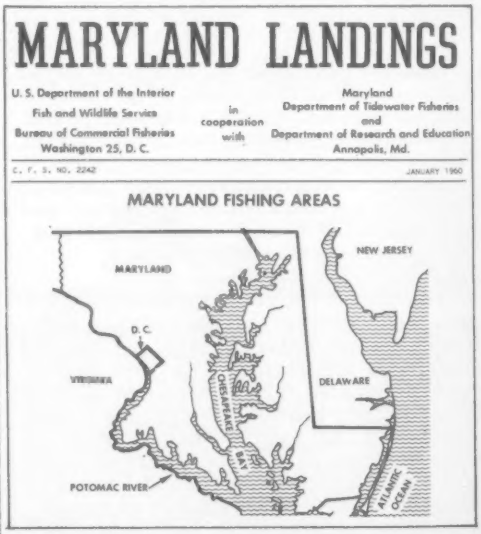
The isogonic lines are derived from the Coast and Geodetic Survey's extensive file of world-wide geomagnetic data. These same data were used earlier by the Bureau in compiling the U.S. Navy Hydrographic Office World charts showing the world-wide magnetic variation for the 1960 epoch. The charts for the United States show the general pattern indicated on the series of world charts, but in greater detail made possible by the greater density of magnetic observations in continental areas. Isogonic lines in Canadian areas were furnished by the Dominion Observatory, Department of Mines and Technical Surveys, Ottawa.

These charts are the latest of a long series of magnetic charts published by the Coast and Geodetic Survey as a navigational aid and for other scientific and engineering purposes. The isogonic charts are of particular interest to the navigator, surveyor, prospector, and scientist. Magnetic information in the form of compass roses and isogonic lines appearing on nautical and aeronautical charts of the Unites States published by the Coast and Geodetic Survey is based on the isogonic charts. The charts may be used for quick and accurate determination of declination by simple inspection without measurement of any kind.

Chesapeake Bay States

MONTHLY FISH LANDING BULLETINS FOR MARYLAND AND VIRGINIA:

Two new monthly bulletins showing the landings of fish and shellfish in Maryland and Virginia ports will henceforth be issued by the U. S. Bureau of


MARYLAND LANDINGS

U. S. Department of the Interior
Fish and Wildlife Service
Bureau of Commercial Fisheries
Washington 25, D. C.

in cooperation with

Maryland
Department of Tidewater Fisheries
and
Department of Research and Education
Annapolis, Md.

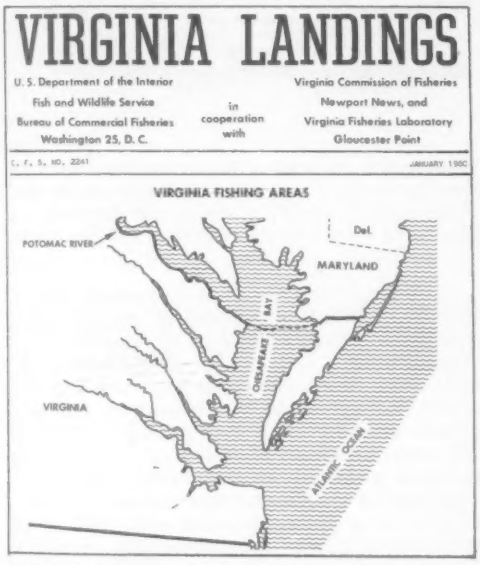
C. F. S. NO. 2242 JANUARY 1960

MARYLAND FISHING AREAS

Commercial Fisheries in cooperation with the fishery agencies of the two States. The first issue of each report has been issued and each covers the landings in each of those States during January.

Virginia data are obtained in cooperation with the Virginia Commissioner of Fisheries and the Virginia Fisheries Laboratory. The Maryland information is obtained through the Maryland Department of Tidewater Fisheries and the Department of Research and Education.

The addition of these two bulletins brings to 17 the number of monthly landings bulletins issued by the Bureau in cooperation with the respective States.


VIRGINIA LANDINGS

U. S. Department of the Interior
Fish and Wildlife Service
Bureau of Commercial Fisheries
Washington 25, D. C.

in cooperation with

Virginia Commission of Fisheries
Newport News, and
Virginia Fisheries Laboratory
Gloucester Point

C. F. S. NO. 2261 JANUARY 1960

VIRGINIA FISHING AREAS

POTOMAC RIVER
Del.
MARYLAND
CHESAPEAKE BAY
VIRGINIA
ATLANTIC OCEAN

All of these are for coastal states except for the Ohio bulletin which covers the landings of that State from Lake Erie.

The other states for which monthly landings publications are available are Maine, Massachusetts, Rhode Island, New York, New Jersey, North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, Louisiana, Texas, California, and Ohio.

Over half of the Atlantic Ocean-Gulf of Mexico harvest of blue crabs and nearly 70 percent of the eastern oysters are landed in the Chesapeake Bay States of Maryland and Virginia.

Federal Purchases of Fishery Products

DEPARTMENT OF DEFENSE PURCHASES, JANUARY-FEBRUARY 1960:

Fresh and Frozen Fishery Products: For the use of the Armed Forces under the Department of Defense, 1.8 million pounds (value $912,000) of fresh and frozen fishery products, were purchased in February 1960 by the Military Subsistence Supply Agency. This exceeded the quantity purchased in January by 21.4 percent and was 26.4 percent above the amount purchased in February 1959. The value of the purchases in February 1960 was higher by 23.7 percent as compared with January and 17.4 percent above February 1959.

Table 1 - Fresh and Frozen Fishery Products Purchased by Military Subsistence Supply Agency, February 1960 with Comparisons

QUANTITY				VALUE			
February		Jan.-Feb.		February		Jan.-Feb.	
1960	1959	1960	1959	1960	1959	1960	1959
(1,000 Lbs.)				($1,000)			
1,817	1,437	3,314	2,296	912	777	1,649	1,621

During the first two months of 1960 purchases totaled 3.3 million pounds (valued at $1,649,000)--an increase of 13.3 percent in quantity and 1.7 percent in value as compared with the similar period in 1959.

Prices paid for fresh and frozen fishery products by the Department of Defense in February 1960 averaged 50.2 cents a pound, 1.0 cent higher than the 49.2 cents paid in January, but 3.4 cents less than the 53.6 cents paid during February 1959.

Canned Fishery Products: Tuna was the principal canned fishery product purchased for the use of the Armed Forces during February this year. In the first two months of 1960, purchases of canned tuna were up 35.1 percent, but for canned sardines were down by 16.2 percent as compared with the same period in 1959.

Table 2 - Canned Fishery Products Purchased by Military Subsistence Supply Agency, February 1960 with Comparisons

Product	QUANTITY				VALUE			
	February		Jan.-Feb.		February		Jan.-Feb.	
	1960	1959	1960	1959	1960	1959	1960	1959
	(1,000 Lbs.)				($1,000)			
Tuna	566	368	1,017	753	260	189	451	381
Salmon	-	-	-	-	-	-	-	-
Sardine	25	25	31	37	10	9	14	13

No canned salmon was purchased during January-February 1960 and 1959.

Note: Armed Forces installations make some local purchases not included in the data given; actual total purchases are higher than shown because local purchases are not obtainable.

Fisheries Loan Fund

LOANS APPROVED, JANUARY 1-FEBRUARY 29, 1960:

As of February 29, 1960, a total of 707 applications for fisheries loans totaling $21,959,268 had been received since the program was started in December 1956. Of these, 372 ($8,663,534) have been approved, 239 ($6,860,774) have been declined or found ineligible, 56 ($2,499,156) have been withdrawn by applicants before being processed, and 40 ($2,902,729) are pending. Several of the pending cases have been deferred indefinitely at the request of the applicants. Sufficient funds are available to process new applications when received.

The following loans had been approved between January 1 and February 29, 1960:

New England Area: Sofus Martensen, New Bedford, Mass., $71,600.

South Atlantic and Gulf Area: Edly B. Shipman, New Smyrna Beach, Fla., $6,500; Elroy Leonard, Charlotte, N. C., $19,500; Albin W. Gerds, Brownsville, Tex., $7,400; and Ralph J. White, Brownsville, Tex., $40,500.

California: Earl E. Harvey, Eureka, $9,500; Frank P. LaGamma, Lemon Grove, $17,000; Donald L. Sawyer, San Diego, $7,645; and John Sima and Tony Zangaro, San Pedro, $28,900.

Pacific Northwest Area: Arthur H. Paquet, Astoria, Oreg., $20,548; Louis S. Mattocks, Seaside, Oreg., $10,000; Humphrey L. Tyron, Marysville, Wash., $6,550; Michael Nicpon, Port Angeles, Wash., $4,500; Boat Sea Star, Seattle, Wash., $39,296; and Reuben Troberg, Seattle, Wash., $2,000.

Alaska: William A. Eklof, Homer, $8,000; and Gerald G. Bennett, Ketchikan, $8,000.

Frozen Foods

PACKERS CLARIFY THEIR POSITION ON FROZEN FOOD CODE:

At its annual meeting in mid-March 1960 the Board of Directors of the National Association of Frozen Food Packers (NAFFP), whose membership includes nearly 85 percent of the industry

producers, acted to clarify its position on the frozen food code of the Association of Food and Drug Officials of the United States (AFDOUS) by adopting the following resolutions:

1. That NAFFP has long recognized the desirability of achieving the goal of a uniform temperature of 0° F. for the commercial handling of frozen foods, and continues to approve that goal. This goal should be achieved in a reasonable and practicable manner with recognition of the responsibility of industry to continue to make available to the public, adequate supplies of sound and wholesome frozen foods. It is not consistent with the fulfillment of this responsibility to establish an absolute product temperature of 0° F., since, within reasonable limits, temporary deviations from the zero level will not affect the soundness of wholesomeness of such foods;

2. That the membership be invited to channel matters of compliance with bacterial and temperature specifications in the State of Massachusetts, or in other states or municipalities, through the headquarters office so that such matters can be dealt with on a unified basis. Assistance on such matters may be offered to nonmembers if it appears that to do so would be in the interest of the industry.

3. That it is the view of NAFFP that the AFDOUS Code should be considered as a manual of operating practices and objectives; that it should not be proposed for adoption as statute or regulation. Its provisions do not lend themselves to en-

forcement as statutory enactments of regulations with criminal penalties for their violation. They may provide, however, the basis for obtaining the common objectives of both industry and the Association of Food and Drug Officials of the United States, which are stated in this resolution.

Gulf Exploratory Fishery Program

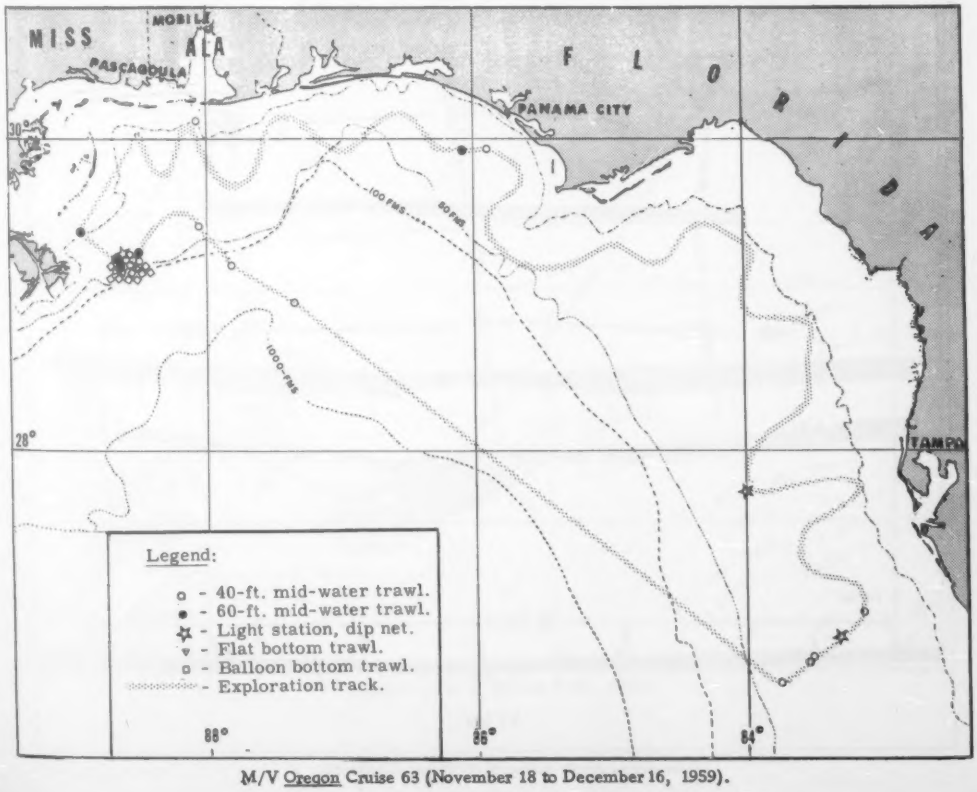
MIDWATER TRAWLING FOR SCHOOL FISH IN THE GULF OF MEXICO CONTINUED:

M/V "Oregon" Cruise 63: First successful commercial-scale mid-water trawling in the Gulf area was accomplished by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Oregon (November 18-December 16, 1959) when catches of 3,000 to 5,000 pounds of bumpers (Chloroscombrus) were made from mid-water depth recorder indications of fish schools.

Underwater observations and motion pictures were made of the 40- and 65-foot square midwater trawls that have been previously used in the Gulf project. Several defective performance features were noted, which summarily resulted in poor horizontal spread of the net. Unequal stresses on the hangings along the wings and body and insufficient door spread appeared to be the principal malfunctions. Vertical opening was satisfactory.

The trawls were rehung and 5-foot by 10-foot rectangular doors were constructed. After some modifications to the door bridles, a notable increase in horizontal spread was observed.

Scouting transsects were made. Concentrations of midwater fish were not



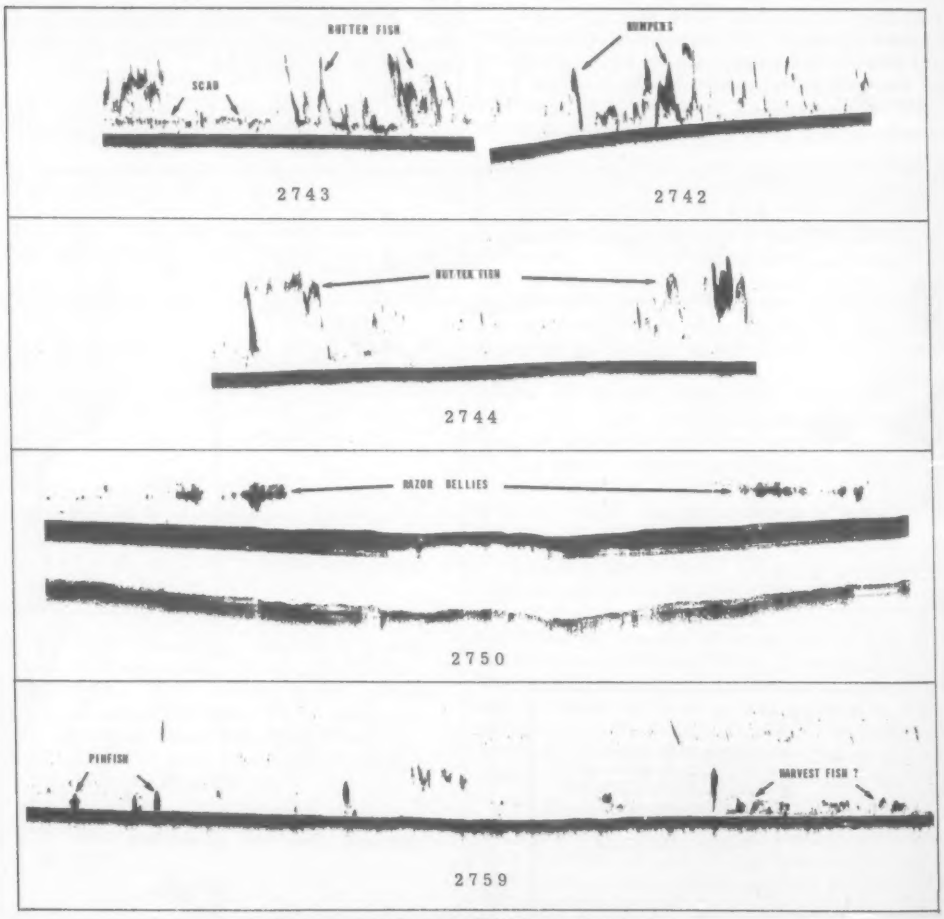
M/V Oregon Cruise 63 (November 18 to December 16, 1959).

found until the vessel traversed the 40-fathom curve, east of the Mississippi Delta, where test fishing in rough seas yielded clean catches of 4" to 8" bumpers of 3,000 to 5,000 pounds per hour tow, using the 65-foot midwater trawl. A few menhaden were mixed in the catches. The sets were made on heavy recorder tracings in depths of 30 to 35 fathoms where bottom depths varied between 39 and 41 fathoms. Malfunctioning of the trawl-depth telemeter at this time allowed only approximate positioning of the trawl in the schools.

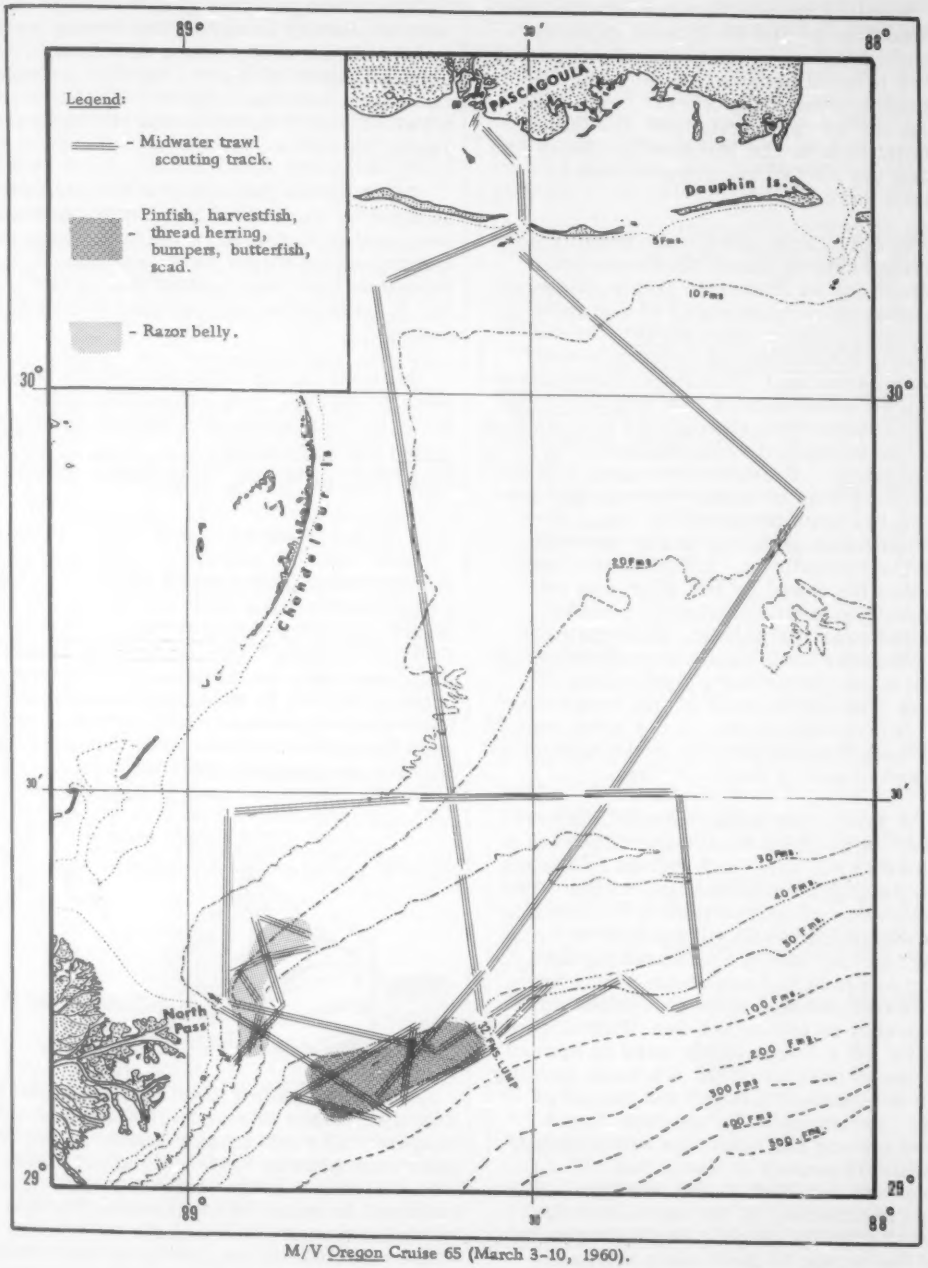
Bottom trawling with shrimp trawls was conducted in the same area "under" the recorder indications and the catches were devoid of bumpers and menhaden.

Nightlight dip-netting in the area yielded several 6" to 8" menhaden. Numerous small scattered schools of mullet were observed around the vessel during the night.

M/V "Oregon" Cruise 65: During March 3-10, the M/V Oregon continued midwater trawling operations for industrial and food fishes in the north central Gulf of Mexico to obtain additional information on seasonal occurrence and availablity of fish stocks to midwater trawling gear.



Echo-grams made during M/V Oregon Cruise 65.



M/V Oregon Cruise 65 (March 3-10, 1960).

Scouting transects were made between the 5- and 60-fathom curves. Concentrations of midwater fish schools were located between the 40- and 50-fathom curves from 29°12' north latitude, 88°34' west longitude (32-fathom lump), west to the Mississippi Delta and along the 20-fathom contour east of North Pass.

Twenty-three tows were completed on moderate to heavy depth-recorder indications of midwater fish schools. Catches were comprised of bumpers (Chloroscombrus chrysurus), thread herring (Opisthonema oglinum), scad (Decapterus sp.), pinfish (Lagodon rhomboides), razorbellies (Harengula pensacolae), butterfish (Poronotus triacanthus), and harvestfish or star butters (Peprilus alepidotus). The best individual tow contained 3½ tons of mixed harvest and pinfish. Six tows produced no catch although made on fairly heavy depth-recorder indications. Either these fish evaded the trawl or the gear was improperly positioned when the vessel passed over the school. Correlations of recorder indications with trawl catches indicate some mixed schooling of these species in most of the areas fished. An exception was in the area east of of North Pass where the catch was comprised solely of razorbellies.

A sixty-foot-square nylon midwater trawl, with mesh sizes tapering from 5 inches in the wing to 2 inches in the bag, was used during the fishing trials. The bottom bosom was extended 20 feet into the wings (inverted top square) to form a projecting barrier to sounding fish. This appears to have some merit as midwater catches have increased considerably following its use. Rectangular doors, 10 x 5 feet, were used to spread the trawl horizontally. Vertical opening was maintained through the use of 23 7-inch "up- thruster" aluminum floats strung along the headrope and approximately 35 pounds of chain and two depressors attached to the footrope. Vertical positioning of the trawl was accomplished by varying engine r.p.m.'s and the scope of the towing warps. A direct-reading telemeter provided accurate readings of the depth level of the doors. Varying the engine r.p.m.'s provided satisfactory positioning within a 5-fathom range. For greater range it was necessary to adjust the towing warp scope. Some correlation was possible between depth of doors, depth of schools, and catch, and this indicated that the trawl normally fished some distance above the doors.

Attempts to raise fish to the surface at night by the use of mercury-vapor and underwater lights were uniformly unsuccessful which might have been due to the subnormal surface temperatures (45°-50° F.) encountered throughout the areas fished.

Samples of the various species taken were preserved and frozen for further study by Pascagoula laboratory technologists and biologists.

Note: Also see Commercial Fisheries Review, November 1959, p. 38, July 1959, pp. 34-36.

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LAMPARA SEINE TESTS ON FISH CONTINUED OFF WEST COAST OF FLORIDA:

M/V "Oregon" Cruise 64: To obtain additional data on lampara seining of fish schools, the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Oregon conducted further tests during a 26-day cruise (January 19-February 16, 1960) off the west coast of Florida.

Adverse weather conditions persisted throughout the cruise. High winds and seas coupled with subnormal surface water temperatures greatly curtailed fishing activities. Apparently the surface schooling habits of herring-like fish were affected by the thermogradient as bottom temperatures were found to be consistently warmer than surface temperatures throughout the areas fished. This condition may account for the fact that no surface schools were sighted during the cruise.

Two lampara seine sets were attempted on subsurface concentration of thread herring which were located by aerial spotting. Neither set produced significant catches though the aerial spotter reported the fish completely entrapped when the wings were brought aboard the purse boat. Indications were that the fish escaped through the wing meshes and the head of the seine.

Both mercury-vapor and incandescent lamps were used as fish attractors during the scoop-lift net trials. The mercury lights appeared to be considerably more effective than the incandescent lights. The limited trials with the scoop-lift net suggest that this gear may be a practical tool for the capture of sardine-like fishes in the Gulf of Mexico. Further tests are planned for this gear under more favorable operating conditions.

Of particular interest was the attraction of crabs to the mercury lights. On one occasion, hundreds of "Jack Rochester" crabs (Portunus sp.) were taken in the scoop-lift net. Blue crabs (Callinectes sp.) in amounts up to one-half bushel were common in most scoop-lift net sets completed in shallow water. The following species of fish were attracted to the lights and were taken in small quantities with the scoop-lift net: thread herring (Opisthonema sp.), razorbelly (Harengulae sp.), Spanish sardine (Sardinella sp.), anchovies (Anchoa sp.), and menhaden (Brevoortia sp.).

Note: Also see Commercial Fisheries Review, November 1959, p. 39.

Hawaii

COMMERCIAL FISHERIES LANDINGS, 1959:

The commercial fisheries landings of sea and pond fish and shellfish in the State of Hawaii during the calendar year 1959 amounted to 16.6 million pounds, valued at $3.2 million ex-vessel, according to the Hawaiian Division of Fish and Game. As compared with the previous calendar year, the catch showed an increase of 5.2 million pounds, or 45.9 percent in volume, and $546,881, or 20.8 percent, in value. The increase is largely due to the skipjack tuna (Katsuwonus pelamis) catch which increased 5.6 million pounds, or 81.6 percent in volume, and $575,833, or 64 percent in value. In addition to skipjack tuna, landings of other important species which increased substantially were yellowfin tuna (Neothunnus macropterus) by 160,636 pounds, or 39.4 percent, and black marlin (Makaira ampla) by 131,118 pounds, or 43.1 percent. Landings dropped for big-eyed tuna (Parathunnus sibi) by 274,155 pounds, or 17.2 percent, striped marlin (Makaira audax) by 55,280 pounds, or 15.9 percent, pink snappers (Pristipomoides microlepis) by 33,345 pounds, or 27.4 percent, and big-eyed scad (Trachurops crumenophthalmus by 23,008 pounds, or 12.9 percent.

Table 1 - Hawaiian Commercial Fishery Landings and Ex-Vessel Values, 1958-59

Species		1959		1958	
English Name	Hawaiian Name	Quantity	Value	Quantity	Value
		1,000 Lbs.	US$ 1,000	1,000 Lbs.	US$ 1,000
Ocean Catch:					
Amberjack	Kahala	79	23	89	23
Big-eyed scad	Akule	156	125	179	123
Dolphin	Mahimahi	119	53	149	58
Goatfish	Weke-ula Weke Moana Kumu	127	78	141	82
Crevalles	Ulua	63	29	98	39
	Omilu				
Mackerel	Opelu	192	76	188	79
Snappers:					
Gray	Uku	46	22	74	31
Pink	Opakapaka Kalekale	110	56	141	67
Red	Ulaulu koae Ulaulu (ehu)	73	65	89	68
Swordfishes, sailfishes, spearfishes, & marlins	A'u & A'u lepe	797	200	725	184
Tuna & tunalike fish:					
Albacore	Ahipalaha	11	2	16	4
Big-eyed & bluefin	Ahi	1,322	574	1,596	622
Yellowfin	Ahi	569	178	408	117
Skipjack	Aku	12,413	1,475	6,835	899
Bonito	Kawakawa	19	4	42	7
Shellfish:					
Crabs	Kona, Kauakonu	8	4	8	3
Limpet	Opihi	13	5	10	4
Lobster, spiny	Ula	12	8	9	6
Octopus	Hee	4	3	7	4
Shrimp	Opae	-	-	1	1
Squid	Muhee	5	2	25	6
Other fish & shellfish	-	346	139	436	162
Total Ocean Catch		16,484	3,121	11,266	2,589
Pond Catch:					
Clams	Olepe	3	1	4	1
Crabs	Kuakonu, Papai	2	1	2	1
Milkfish	Awa	32	13	16	6
Mullet	Amaama	45	37	57	47
Tilapia	-	2	1	5	1
Other species	-	12	5	11	5
Total Pond Catch		96	58	95	63
Grand Total		16,580	3,179	11,361	2,652

Note: See Commercial Fisheries Review, June 1959, p. 37.

Michigan

REGULATION OF COMMERCIAL FISHERIES NOW RESPONSIBILITY OF CONSERVATION COMMISSION:

Beginning March 19, 1960, regulation of Michigan's commercial fishing industry becomes a responsibility of that State's Conservation Commission. This involves about 1,000 licensed operators

and some 39,000 square miles of Great Lakes waters--nearly twice the combined area of the seven other Great Lakes States. Under its new authority, the Commission will be empowered to adjust regulations with the exception of license fees and penalties.

Department of Conservation officials will study suggested changes concerning mesh sizes, seasons, size limits, and other matters. No quick or marked changes in present regulations are foreseen, however.

The shift in control from the State Legislature to the Commission is designed to create closer contact between the industry and its governing body. Previously, the Commission's power was piecemeal. It was charged with enforcing regulations, licensing fishermen, collecting spawn, and compiling statistics, including daily catch records of licensed fishermen.

Department leaders view the new arrangement as particularly important in setting uniform regulations with other states and Ontario. Control of sea lamprey and rehabilitation of lake trout in the Great Lakes will be important concerns.

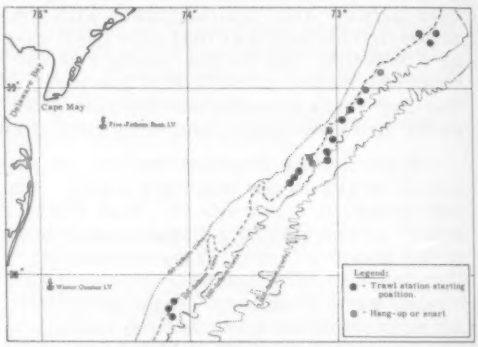
During 1959, Michigan's commercial fishery operators netted approximately 21 million pounds of fish for a vessel value of almost $3 million. The lake trout catch totaled 658,000 pounds, all of which was taken in Lake Superior. Because of the lamprey's predation, lake trout production in the other lakes is nil and even in Lake Superior spawning stock has been all but eliminated by the predator.

North Atlantic Fisheries

Exploration and Gear Research

DEEP-WATER RED CRAB TRAWLING EXPLORATIONS CONTINUED:

M/V "Delaware" Cruise 60-2 (February 11-28, 1960): This cruise was made by the U. S. Bureau of Commercial Fisheries research and exploratory fishing vessel Delaware in cooperation with the Bureau's Fisheries Biological Laboratory, Woods Hole, Mass. The purpose of the cruise was threefold: (1) to complete hydrographic transects from the continental shelf to the Gulf Stream in the area between Georges Bank and Cape Hatteras, (2) to further investigate the distribution and availability to trawling gear of red crabs along the edge of the continental shelf bordering the mid-Atlantic area (February 21-25), and (3) to conduct trawling operations along a series of transects between Cape Hatteras and Martha's Vineyard.



M/V Delaware Cruise 60-2 (February 11-28, 1960).

Deep-water trawl explorations east of Ocean City, Md., indicated concentrations of red crabs (Geryon quinquedens) were reduced at this season of the year, when compared with fishing results obtained at the same location during the summer season.

The largest individual catch taken on the cruise was 89 crabs, weighing approximately 125 pounds, during a 30-minute tow in 250-fathom depth with a standard No. 36 net. No red crabs were found to occur in depths of less than 100 fathoms. The result of tows made at intermediate depths between 90-250 fathoms indicated that except for an occasional stray, the inshore limit of the red crab depth-range at this season is approximately 130 fathoms in the area studied.

The cruise was harassed by bad weather which hampered operations during all phases. However, the coverage of red crab explorations was extended northward from Cape May (northern limit of

previous work) to the Hudson Canyon. The continental slope in the area worked is extremely broken and precipitous, and depth contours were difficult to follow with trawl gear.

A standard No. 36 otter trawl (60' foot rope, 30' head rope) was used on all exploratory tows. Conclusive work in depths exceeding 250 fathoms was impractical due to inadequacy of the electronic equipment.

Note: Also see Commercial Fisheries Review, September 1959, p. 37.

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NEW ENGLAND COMMERCIAL BLUEFIN TUNA PURSE-SEINING, 1959 SEASON:

Commercial-scale purse-seining for bluefin tuna in the waters of the Gulf of Maine in the North Atlantic was continued in 1959 by the converted commercial trawler Silver Mink with limited assistance from the U. S. Bureau of Commercial Fisheries exploratory fishing staff at Gloucester, Mass.

Catch of the Tuna Seiner Silver Mink, 1959

1959	Number of Fish	Weight
		Lbs.
Aug. 3	722	102,420
9	461	64,730
12	225	30,880
15	696	92,770
20	1,943	261,459
21	342	45,220
23	930	124,551
24	509	65,395
26	631	83,952
27	951	117,116
31	367	46,614
Sept. 3	600	76,350
4	515	62,800
5	568	68,880
7	286	37,670
8	206	27,450
10	356	44,575
11	672	85,900
12	150	20,220
15	158	21,900
24	289	33,980
Totals . .	11,577	1,514,832

Note: Average weight of individual fish, 130.8 lbs.

Over 750 tons of bluefin were seined during the 1959 season which extended from August 3 to September 24, and included 21 fishing (operational) days. The catch of tuna landed by the Silver Mink during this period surpassed the 1958 catch by 570 tons. The majority of the seining operations which produced this catch were carried on within a radius of less than 25 miles from Provincetown, Mass.--the home port of the Silver Mink.

Note: Also see Commercial Fisheries Review, February 1959, p. 1.

North Atlantic Fishery Investigations

GULF STREAM INFLUENCE ON FISH DISTRIBUTION AND ABUNDANCE ALONG CONTINENTAL SHELF:

M/V "Delaware" Cruise 60-2 (February 10-26, 1960): A cruise was made by the U. S. Bureau of Commercial Fisheries research vessel Delaware to investigate the influence of the Gulf Stream (slope water and shelf water) on the distribution and abundance of marine fish and invertebrates along the continental shelf and from Cape Hatteras to Martha's Vineyard.

The Service's research vessel, Delaware.

A partial hydrographic transect was made from Cape Ann, Mass., to the Gulf Stream by biologists from the Bureau's Woods Hole Biological Laboratory. Fishing operations were conducted at various depths from 40 to 250 fathoms from the Winter Quarter Lightship, Five Fathom Lightship, and Barnegat Lightship.

Inclement weather throughout most of the cruise hampered the completion of all objectives. A total of 32 species was caught and several species brought back to the Laboratory for further identification. The data collected showed that the hakes (silver hake, American hake, white hake, red hake, and long-finned hake) were the most abundant species caught.

This cruise was executed in three phases. The first and third were on biological objectives, and the second phase was devoted to exploratory fishing for red crab (see p. 26 of this issue).

* * * * *

FISHING SURVEY OF CONTINENTAL SHELF ALONG GEORGES BANK:

M/V "Delaware" Cruise 60-3: A fishing survey of the continental shelf was conducted (March 9-17, 1960) by the U. S. Bureau of Commercial Fisheries research vessel Delaware along the eastern side of Georges Bank. The secondary purpose of the trip was to determine the vertical movements of the whiting or silver hake and American or white hake.

Three transects of six stations, each commencing 5 miles north of Corsair Canyon to Channel, and one transect approximately 13 miles south of Hudson Canyon were the areas of investigation. Trawling was concentrated at 150 fathoms.

Trawling operations with a No. 36 trawl were carried out at only one transect on Georges Bank. Further operations were prevented by foul weather and icing conditions. Trawling operations with a No. 36 and a midwater trawl were carried out through 2 of 3 time periods. The third period was not completed due to adverse weather.

On Georges Bank, 20 species of fish were recorded with numbers of each varying according to depth. At Hudson Canyon 16 species were recorded. Whiting and white hake were most plentiful at 150 fathoms. No fish were taken in the midwater trawl.

North Pacific Exploratory Fishery Program

FISHING GEAR RESEARCH AND EVALUATION STUDIES CONTINUED:

M/V "John N. Cobb" Cruise 45: Fishing gear research and evaluation studies were scheduled by the U. S. Bureau of Commercial Fisheries' exploratory fishing and gear research vessel John N. Cobb in the Straits of Juan de Fuca and along the Pacific Coast of Washington from February 25-April 15, 1960.

SCUBA divers boarding diving sled preparatory to observing bottom trawls in action. Float in background is attached to door of trawl.

Preliminary tests and observations were to be made in the vicinity of Dungeness Spit at the eastern end of the Straits of Juan de Fuca. Comparative fishing tests of the modified trawls were to be made on the trawling grounds between Destruction Island and Cape Flattery off the Washington Coast.

Objectives of the cruise were to complete final modifications on the "free-wing trawl and the "blanket" trawl, which were originally designed and tested in 1959, and to systematically compare the fishing ability of the new nets with that of standard gear.

Nets modified to conform to characteristics suggested by last year's experiments were to be operated and observed in action by SCUBA divers riding a "diving sled." After final adjustments, test fishing was to be conducted on commercial bottomfish grounds. The new nets were to be compared as to efficiency with

a standard 400-mesh eastern-type otter trawl.

Note: Also see Commercial Fisheries Review, June 1959, p. 44 and May 1959, p. 30.

Radiation Preservation

GOVERNMENT INCREASES RESEARCH ON RADIATION PROCESSING OF FOODS:

Through the stimulus of the Interdepartmental Committee on Radiation Preservation of Foods, definite steps are now being taken to carry forward a national program of research and development on radiation processing of food. This important phase of the President's Atoms for Peace Program was announced on March 28 by Deputy Administrator of the Business and Defense Services Administration, U. S. Department of Commerce. He is Chairman of the nine-agency Committee.

The Atomic Energy Commission has established a program of research and development on low-dose radiaton processing of perishable foods to extend shelf life. During the next five years the Atomic Energy Commission expects to spend approximately $5 million on this project. During fiscal years 1960 and 1961, $115,000 and $500,000, respectively are being devoted to the program. Under the Atomic Energy Commission program, emphasis will be placed on basic studies in food chemistry, microbiology, wholesomeness testing, preservation factors of shelf life extension and radiation processing technology.

The Department of the Army has approved a revised Army food irradiation program. Over a six-year period, the Army Research program will cost an estimated $5 million. It also proposes to construct a radiation food research facility to cost about $1.8 million. This facility will consist of a megacurie cobalt 60 gamma irradiator, variable voltage linear electron accelerator, and associated facilities with emphasis on high-dose treatment of foods.

The Departments of Agriculture, Interior, and Commerce have conducted research and development in their respective areas and indicate they plan to continue their individual programs in cooperation with the Army and the Atomic Energy Commission. Interior's work is on fishery products.

Research on the use of radiation for processing food must take into account the provisions of the several food regulatory acts, such as those administered by the Department of Health, Education and Welfare, and the Department of Agriculture. The wholesomeness and safety of radiation-processed food must therefore be established to the satisfaction of those agencies.

Agencies represented on the Committee are: Departments of State, Interior, Agriculture, Commerce, Health, Education and Welfare, Army, Atomic Energy Commission, Small Business Administration, and International Cooperation Administration.

As the national research and development program on radiation processing of food progresses, the Interdepartmental Committee through its member agencies will encourage commercial adoption of this technology.

Note: Also see Commercial Fisheries Review, October 1959, p. 16.

South Atlantic Exploratory Fishery Program

EXPLORATORY TRAWLING OPERATIONS OFF SOUTH ATLANTIC COAST:

M/V "Silver Bay" Cruise 22: An exploratory fishing survey was conducted along the South Atlantic Coast between Cape Hatteras, N. C., and Brunswick, Ga., during a 32-day cruise of the U. S. Bureau of Commercial Fisheries chartered fishing vessel Silver Bay, which ended on March 18, 1960. During the survey, 186 stations were made in depths ranging from 5-150 fathoms.

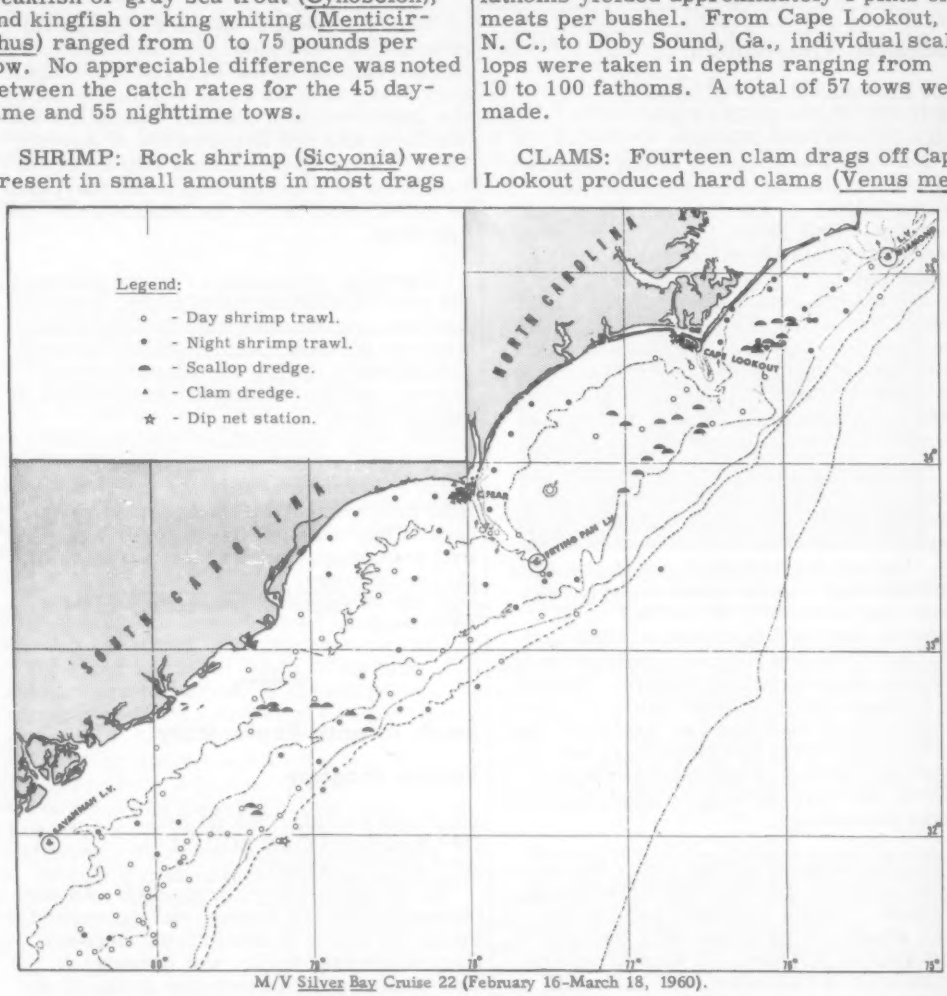
FISH: Exploratory trawling produced maximum catches of 1,000 pounds of mixed fish per one-hour drag. The best catches were made outside the 15-fathom curve

and consisted mostly of porgies (Stenotomus), lizardfish (Synodus), sea robins (Prionotus), ling (Urophycis), small spots (Leiostomus), and croakers (Micropogon). Catches of flounders (Paralichthys), weakfish or gray sea trout (Cynoscion), and kingfish or king whiting (Menticirrhus) ranged from 0 to 75 pounds per tow. No appreciable difference was noted between the catch rates for the 45 daytime and 55 nighttime tows.

SHRIMP: Rock shrimp (Sicyonia) were present in small amounts in most drags from Cape Lookout to Savannah in the 15-70 fathom depth range. Individual pink shrimp (Penaeus duorarum) and white shrimp (P. setiferus) were found in the 10-20 fathom depth range. No concentrations were observed.

SCALLOPS: Catches as high as 15 bushels of scallops (Pecten gibbus) per $\frac{1}{2}$-hour drag were made in 16-19 fathoms off Core Banks, N. C. These catches were exceptionally free of trash. One 80-pound bushel yielded $3\frac{1}{2}$ pints of meats. Subsequent catches with a balloon trawl in 21 fathoms yielded approximately 4 pints of meats per bushel. From Cape Lookout, N. C., to Doby Sound, Ga., individual scallops were taken in depths ranging from 10 to 100 fathoms. A total of 57 tows were made.

CLAMS: Fourteen clam drags off Cape Lookout produced hard clams (Venus mercenaria sp.) at the rate of 1 to 5 bushels per hour. Limited explorations off the mouth of the Cape Fear River produced from zero to 24 clams per 15-minute tow in the 6 to $6\frac{1}{2}$-fathom depth range. The clams ranged from 4-$5\frac{1}{2}$ inches in length and were equal in taste and texture to those previously located off Beaufort Inlet, N. C. A total of 28 drags were made.



M/V Silver Bay Cruise 22 (February 16-March 18, 1960).

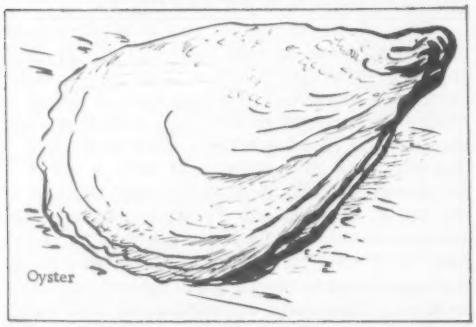
GEAR: More than half the drags were made with 41'/47', ½-inch mesh cotton balloon trawl fished with 44' tickler chain 6' chain doors, and 6' legs on a 25-fathom bridle. One tow was with a 70'/90', 2½-inch mesh nylon fish trawl on 8' bracket doors. For clams, a 14-tooth Fall River-type clam dredge was used. For scallops, a modified 8' Georges Bank-type scallop dredge with 2" rings and 1½" mesh liner was used.

Note: Also see Commercial Fisheries Review, March 1960, p. 26 and February 1960, p. 42.

South Carolina

FISHERIES BIOLOGICAL RESEARCH PROGRESS, JANUARY-MARCH 1960:

Oyster Research: To determine with reasonable accuracy progress of seed planted on a subtidal oyster bed in the Ashepoo River, individual oysters from

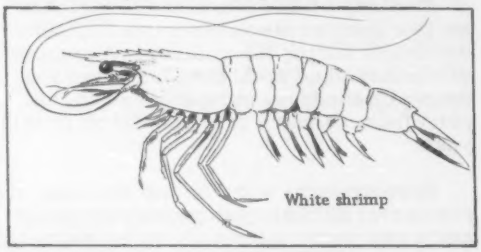

Oyster

three plantings and native oysters dredged from the area prior to planting were measured, numbered, and placed in covered wire baskets. These baskets were attached to a wire cable which was then anchored on the bed, so that the baskets could be recovered easily. These oysters will be measured at intervals and records kept as to growth and mortality, according to Progress Report No. 43, Bears Bluff Laboratories, Wadmalaw Island, S. C.

Salinities in the area of experimental planting have varied widely during January-March--from 24.5 parts per thousand recorded January 12, to 11.6 parts per thousand on March 18, both from bottom samples.

Shrimp Research: The shrimp research continued on schedule throughout the quarter with experimental drags in inshore waters. Small white shrimp and croakers were particularly abundant, showing considerable increases over the same periods for 1958 and 1959. The abundance of white shrimp during the past winter should indicate a good catch for this species in the coming year, provided no great damage was caused by the cold snap experienced in March.

White shrimp were 88 percent more abundant in experimental drags at eight regular stations during January-March 1960 than for the same period of 1959, and were over 97 percent more abundant than during the same quarter in 1958.


White shrimp

Croakers were up 65 percent over last year and 82 percent greater than in 1958. Although spot showed no large increase, the average catch per unit of effort for this species was somewhat greater for the 1960 quarter than for the corresponding periods of 1958 and 1959.

A new program for the study of commercial shrimp postlarvae was initiated at Bears Bluff in January of this year. As a part of this study, 73 standard plankton tows were made during the quarter at regular stations throughout the shrimp survey area. A primary objective of this study is to determine the feasibility of obtaining postlarval shrimp as seed stock for commercial ponds. It is also felt that research on postlarval shrimp will prove of great value in the future with regards to such matters as predicting yearly abundance and distribution of commercial shrimps.

Considerable numbers of Penaeus aztecus postlarvae were taken in plankton tows during late February and early March, particularly in the Calibogue Sound and North Edisto River areas.

Shortly after the beginning of the cold spell in March, however, the numbers of these postlarvae declined suddenly at all stations. The extent of damage caused by the 6-10° F. drop in water temperatures cannot at present be ascertained.

Pond Cultivation: During the quarter, the Laboratories' oyster pond was drained and a considerable amount of silt was washed out by means of a pressure hose. Silting poses a great problem to oyster cultivation generally, and is particularly troublesome in pond cultivation. Experiments with transplanted seed oysters were expected to be resumed in the oyster pond during the second quarter.

Stocking of flounders and forage fishes in a quarter-acre experimental pond continued during the quarter. A number of northern and southern fluke, and four-spotted flounders, were stocked in the pond from January through March of this year.

Experimental work on the stocking of postlarval shrimp, using concrete tanks and a one-tenth-acre salt-water pond, is also in progress.

Transportation

RAILROADS ATTEMPTING TO MEET MOTOR CARRIER RATES FOR SHRIMP:

The Southwestern Freight Bureau, Inc., has proposed trailer-on-flatcar service (TOFC) rates on frozen shrimp from Texas and Louisiana points to compete with charges of exempt motor carriers. Following is a list and a comparison of rates:

Origin	Destination	Competitive Exempt Truck Rates	TOFC Rates
		(Rate Per 100 Lbs.)	
New Orleans, La.	Memphis, Tenn.	$ 1.25	$ 1.25
New Orleans, La.	Chicago, Ill.	1.75	1.75
New Orleans, La.	Des Moines, Iowa	2.00	1.75
New Orleans, La.	Minneapolis, Minn.	2.25	2.25
Galveston, Tex.	Memphis, Tenn.	1.50	1.50
Galveston, Tex.	Des Moines, Iowa	2.00	1.75
Galveston, Tex.	Chicago, Ill.	2.00	2.00
Galveston, Tex.	Minneapolis, Minn.	2.25	2.25
Brownsville, Tex.	Memphis, Tenn.	1.75	1.75
Brownsville, Tex.	Des Moines, Iowa	2.25	2.25
Brownsville, Tex.	Chicago, Ill.	2.25	2.25
Brownsville, Tex.	Minneapolis, Minn.	2.50	2.25

The Texas and New Orleans Railroad, which serves Aransas Pass, Palacios, Port Lavaca, and Rockport, Tex., as well as Berwick, Houma, Lafayette, and Morgan City, La., will not be covered by this arrangement. This originating railroad for these places cannot count on sufficient volume of frozen shrimp or other commodities to construct facilities for profitable operation of this kind of service.

The proposed rail rates apply on frozen shrimp in packages subject to a minimum weight of 22,000 pounds based on the net weight of the shrimp. The weight of ice and packages is transported free subject to a limitation that the weight thereof shall not exceed 30 percent of the weight of the frozen shrimp. Shipments in trailers are accepted only when the carrier has suitable equipment.

The proposed rates are subject to diversion and reconsignment rules which provide that where instructions are received in sufficient time to be effected before the trailer is unloaded, the first diversion or reconsignment is without charge, the second is $5, and the third and fourth are made at $10 each.

The railroads earlier established favorable rates into the northeast for shrimp in regular carload lots but have yet failed to attract any significant volume of shipments.

This is another endeavor by railroads to meet exempt motor carrier competition. It is unusual for the railroads to charge on a net-weight basis. This points up the interest of railroads to attract shrimp traffic.

Tuna

TWO LARGE CALIFORNIA PACKERS OPERATING IN WEST AFRICA:

One of the three large California tuna packers in the fall of 1959 bought an existing cold-storage plant at Freetown, Sierra Leone, in West Africa, and is going ahead with plans to enlarge it into an Atlantic tuna fishing base. The company has come to an agreement with a large Japanese fishing company over the use of the base, and during February three Japanese tuna boats were expected to land fish at Freetown. The fish was to be transshipped to the packer's plant in Puerto Rico. The boats scheduled to land were No. 18 Azuma Maru (100 tons of albacore), the No. 1 Koyo Maru (280 tons of albacore), and the No. 2 Banshu Maru (770 tons of albacore), or a total of 1,150 tons. The cold-storage plant at Freetown was a small plant with only 150-ton capacity when purchased, but it has now been enlarged to an estimated 500-ton capacity. It is said that plans call for enlargement to 3,000-ton capacity soon.

Another of the three large California packers is also going ahead with plans for a cold-storage plant at the new port of Eima outside of Accra, in Ghana.

Japanese trading companies are also surveying West Africa areas at present with similar plans.

United States Fishing Fleet[1/] Additions

FEBRUARY 1960:

A total of 26 vessels of 5 net tons and over was issued first documents as fishing craft during February 1960--a decrease of one vessel compared with the same month in 1959. The South Atlantic and Pacific areas led with 7 vessels each. The Chesapeake area followed with 4 vessels, while the Middle Atlantic and Gulf areas were next with 3 each. The remaining 2 vessels were issued first documents in the Great Lakes and New England areas.

Table 1 - U. S. Vessels Issued First Documents as Fishing Craft by Areas, February 1960

Area	February		Jan.-Feb.		Total
	1960	1959	1960	1959	1959
	(Number)				
New England	1	-	2	2	15
Middle Atlantic	3	-	4	-	12
Chesapeake	4	4	9	13	106
South Atlantic	7	4	10	12	76
Gulf	3	10	7	16	135
Pacific	7	5	9	8	97
Great Lakes	1	2	1	3	6
Alaska	-	2	-	2	32
Total	26	27	42	56	479

Note: Vessels have been assigned to the various areas on the basis of their home ports.

Table 2 - Vessels Issued First Documents as Fishing Craft by Tonnage, February 1960

Net Tons	Number
5 to 9	14
10 to 19	2
20 to 29	3
30 to 39	3
40 to 49	2
60 to 69	1
330 to 339	1
Total	26

Forty-two vessels were issued first documents during the first 2 months of 1960--14 vessels less than were reported during the same period of last year. Most of the decline was in the Gulf area which represented a decrease of 9 vessels as compared with the same period in 1959.

1/Includes both commercial and sport fishing craft.

U. S. Foreign Trade

CANNED FISH AND SHELLFISH EXPORTS, 1959:

United States exports of canned fish and shellfish have steadily declined in both value and quantity from 1955 through 1958. In 1959 there was a change and an increase took place in both quantity and value.

Table 1 - United States Exports of Fish and Shellfish, 1955-59

Item	1959	1958	1957	1956	1955
	(Millions of Lbs.)				
Quantity:					
Fish	54	32	51	63	71
Shellfish	13	8	17	19	18
Total	67	40	68	82	89
	(Millions of $)				
Value:					
Fish	17	11	12	13	17
Shellfish	4	3	4	5	4
Total	21	14	16	18	21

Table 2 - United States Exports of Fish and Shellfish by Principal Products, 1958-59

Product	1959		1958	
	Lbs.	$	Lbs.	$
Canned fish:				
Salmon	13,825,940	10,638,661	9,226,711	6,668,900
Sardines in oil	1,271,215	292,713	645,419	164,428
Sardines not in oil	37,453,480	5,843,435	17,846,275	3,231,400
Tuna	232,919	138,856	335,536	216,073
Mackerel	743,046	134,988	2,307,753	332,835
Fish, not elsewhere covered	371,847	326,474	1,199,115	495,844
Total canned fish	53,898,447	17,375,127	31,530,809	11,109,480
Canned shellfish:				
Shrimp	2,876,493	2,898,453	2,161,451	2,548,019
Squid	9,156,111	905,516	5,583,257	500,711
Shellfish, not elsewhere covered	598,769	466,587	595,664	372,123
Total canned shellfish	12,631,373	4,270,556	8,340,372	3,420,853

* * * * *

EDIBLE FISHERY PRODUCTS, JANUARY 1960:

Imports of edible fresh, frozen, and processed fish and shellfish into the United States during January 1960 decreased by 16.4 percent in quantity and 12.1 percent in value as compared with December 1959. The decrease was due primarily to lower imports of groundfish and other fillets (down 7.6 million pounds) and frozen albacore and other tuna (down 8.6 million pounds), and to a lesser degree, a decrease in the imports of fresh and frozen salmon and shrimp. The decrease was partly offset by a 3.7-million-pound increase in the imports of canned salmon.

United States Foreign Trade in Edible Fishery Products, January 1960 with Comparisons

Item	Quantity			Value		
	January		Year	January		Year
	1960	1959	1959	1960	1959	1959
	(Millions of Lbs.)			(Millions of $)		
Imports:						
Fish & shellfish: Fresh, frozen, & processed[1/]	81.7	88.2	1,070.5	24.8	24.8	309.8
Exports:						
Fish and shellfish: Processed only[1/] (excluding fresh & frozen)	6.6	2.4	68.0	1.8	0.8	22.8

1/Includes pastes, sauces, clam chowder and juice, and other specialties.

Compared with January 1959, the imports in January this year were lower by 7.3 percent in quantity, but the value was unchanged. Lower imports of groundfish and other fillets (down 10.4 million pounds) and tuna other than albacore (down 2.7 million pounds) were primarily responsible for the decrease. Compensating, in part, for the decreases were increases of 3.8 million pounds in the imports of frozen albacore tuna, canned salmon (up 3.9 million pounds), and lobster and spiny lobster (up 1.8 million pounds).

United States exports of processed fish and shellfish in January 1960 were up by 20.6 percent in quantity and 20.0 percent in value as compared with December 1959. Compared with the same month in 1959, the exports this January were higher by 173.8 percent in quantity and 125.0 percent in value.

Total exports of processed fish and shellfish for calendar year 1959 were up about 65.0 percent in quantity and 41.2 percent in value as compared with 1958.

Wage-Hour Fishery Exemption

BREADED SHRIMP PROCESSING COMES UNDER EXEMPTION:

With reference to Secretary of Labor Mitchell's order requiring shrimp breading plants to pay Federal minimum wages under the Wage-Hour Law, Federal Judge Frank Scarlett recently rejected the Labor Secretary's order. The Wage-Hour Law includes the fishery exemption, which the Wage-Hour Administrator and the Secretary of Labor, through an interpretation, have tried to upset. The fishing industry has won a number of legal cases on the fishery exemption, but the Wage-Hour Administrator continues to bring court action in other jurisdictions.

The Federal Judge's ruling applies not only to the firm in Thunderbolt, Ga., which was involved in the case, but also to other firms engaged in shrimp processing. A St. Simons Island, Ga., shrimp firm intervened in the case on the side of the Thunderbolt, Ga., firm.

In his finding, the Federal Judge cited an exception allowed by Congress to the seafood industry and said if he found otherwise many packers might be put out of business since under the Wage-Hour Law employees may demand additional wages for the past two years.

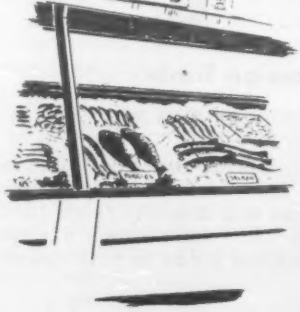
The Labor Secretary last year said that adding as much as 20 percent of bread to a seafood ended its exemption as intended by Congress. The plants add varying amounts of breading, often running to about 50 percent.

Wholesale Prices, March 1960

The March 1960 wholesale price index for edible fishery products (fresh, frozen, and canned) at 123.4 percent of the 1947-49 average was up 1.3 percent from the preceding month. Supplies of many fresh fish and shellfish items were curtailed sharply in March due to extremely stormy weather and resulted in higher wholesale prices for many fresh fishery products. From March a year ago to this March the wholesale fishery products price index was down by 3.7 percent due primarily to lower fresh and frozen shrimp prices and frozen haddock fillet prices.

The market for fresh haddock at Boston in March this year continued to be weak due to seasonally better landings and large inventories of frozen fillets. All other items in the drawn, dressed, and whole finfish subgroup were higher in March this year as compared with the preceding month with the exception of frozen dressed halibut, which was unchanged. The net result was an increase of one percent for the subgroup as a whole from February to March this year. Compared with March 1959 the subgroup wholesale price index was lower by 3.3 percent due chiefly to 12.4 percent lower drawn haddock prices at Boston and a drop of 12.4 percent in frozen dressed halibut prices. Lower prices for these items more than offset increases in the wholesale prices for frozen king salmon, fresh-water drawn whitefish and round yellow pike.

Fresh processed fish and shellfish prices in March this year were up by 5.7 percent from the preceding month due to a sharp rise (13.4 percent) in the wholesale price for fresh shrimp at New York and a lesser increase of about 1.0 percent in the price for fresh shucked oysters. These increases in March more than offset a 15.8-percent drop in the fresh small haddock fillet price. From March last year to March this year the subgroup wholesale price index dropped



2.5 percent. Fresh haddock fillets were lower by 27.4 percent and fresh shrimp down by 11.5 percent in March this year as compared with March 1959. During the same period shucked oyster prices rose 14.9 percent.

The wholesale price index for frozen processed fish and shellfish in March 1960 was down 1.0 percent from February. Frozen shrimp prices increased slightly (less than 1/2 cent a pound) and frozen ocean perch fillets rose by 3.6 percent in March from the preceding month. These increases in March this year over the preceding month were more than offset by an 8.0-percent drop in frozen haddock fillet prices. In March 1960 the subgroup wholesale price index was down by 18.5 percent from March a year ago. Lower frozen fillet prices (particularly haddock which was down by 27.8 percent) plus a 21.0-percent drop in frozen shrimp prices were responsible for the decline.

Primary wholesale prices for canned fishery products remained unchanged in March 1960 for the fourth straight month. Supplies of California sardines and domestic canned salmon at the primary distributor level were about exhausted at the end of March. In addition stocks of Maine sardines were only fair and the only canned fish item in good supply was canned tuna. Compared with March 1959, primary canned fish prices were up about 5.1 percent this March due to higher prices for canned salmon and both California and Maine sardines. However, canned tuna prices were lower by 1.8 percent this March as compared with March 1959.

Table 1 - Wholesale Average Prices and Indexes for Edible Fish and Shellfish, March 1960 With Comparisons

Group, Subgroup, and Item Specification	Point of Pricing	Unit	Avg. Prices 1/ ($)		Indexes (1947-49=100)			
			Mar. 1960	Feb. 1960	Mar. 1960	Feb. 1960	Jan. 1960	Mar. 1959
ALL FISH & SHELLFISH (Fresh, Frozen, & Canned)					123.4	121.8	121.9	128.2
Fresh & Frozen Fishery Products:					137.6	134.9	135.1	148.8
Drawn, Dressed, or Whole Finfish:					148.5	147.2	148.7	153.6
Haddock, lge., offshore, drawn, fresh	Boston	lb.	.12	.12	116.9	120.9	127.4	149.2
Halibut, West., 20/80 lbs., drsd., fresh or froz.	New York	lb.	.29	.29	90.3	90.3	93.8	103.1
Salmon, king, lge. & med., drsd., fresh or froz.	New York	lb.	.78	.77	174.7	172.5	171.9	168.5
Whitefish, L. Superior, drawn, fresh	Chicago	lb.	.79	.75	195.8	185.9	159.9	166.1
Whitefish, L. Erie pound or gill net, rnd., fresh	New York	lb.	.72	.68	144.7	136.6	161.9	161.8
Yellow pike, L. Michigan & Huron, rnd., fresh	New York	lb.	.78	.73	181.8	170.0	166.5	170.0
Processed, Fresh (Fish & Shellfish):					142.2	134.5	135.8	145.8
Fillets, haddock, sml., skins on, 20-lb. tins	Boston	lb.	.35	.41	117.4	139.5	148.0	161.6
Shrimp, lge. (26-30 count), headless, fresh	New York	lb.	.81	.71	127.2	112.2	106.6	143.8
Oysters, shucked, standards	Norfolk	gal.	6.75	6.63	167.0	163.9	173.2	145.4
Processed, Frozen, (Fish & Shellfish):					109.1	110.2	107.9	133.9
Fillets: Flounder, skinless, 1-lb. pkg.	Boston	lb.	.38	.38	98.1	98.1	98.1	106.0
Haddock, sml., skins on, 1-lb. pkg.	Boston	lb.	.29	.31	89.5	97.3	97.3	124.0
Ocean perch, skins on, 1-lb. pkg.	Boston	lb.	.29	.28	114.8	110.8	108.8	118.8
Shrimp, lge. (26-30 count), 5-lb. pkg.	Chicago	lb.	.68	.68	104.5	104.1	100.3	132.3
Canned Fishery Products:					103.8	103.8	103.8	98.8
Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs.	Seattle	cs.	24.50	24.50	127.8	127.8	127.8	116.1
Tuna, lt. meat, chunk, No. 1/2 tuna (6-1/2 oz.), 48 cans/cs.	Los Angeles	cs.	10.80	10.80	77.9	77.9	77.9	79.3
Sardines, Calif., tom. pack, No. 1 oval (15 oz.), 48 cans/cs.	Los Angeles	cs.	8.00	8.00	93.9	93.9	93.9	86.9
Sardines, Maine, keyless oil, No. 1/4 drawn (3-3/4 oz.), 100 cans/cs.	New York	cs.	8.75	8.75	93.1	93.1	93.1	87.5

1/ Represent average prices for one day (Monday or Tuesday) during the week in which the 15th of the month occurs. These prices are published as indicators of movement and not necessarily absolute level. Daily Market News Service "Fishery Products Reports" should be referred to for actual prices.

FOREIGN

International

INTERNATIONAL JOINT COMMISSION
(UNITED STATES AND CANADA)

INTERNATIONAL PASSAMAQUODDY FISHERIES BOARD COMPLETES ITS INVESTIGATIONS:

Members of the International Passamaquoddy Fisheries Board met with the International Joint Commission on January 13 to 15, 1960, in Boston, Mass. The purpose of the meeting was to explain to the Commission the probable effects of the proposed Passamaquoddy tidal power project upon fisheries of the area, principally in Passamaquoddy and Cobscook Bays in Maine and New Brunswick. Although the dams will eliminate several herring weir sites, and changes in water level will require relocation or reconstruction of others, effects on the abundance of herring are expected to be negligible.

Groundfish landings also will suffer little change, but haddock will be eliminated inside the impoundment, pollock landings will be reduced, and winter flounder catches will increase. Clam production will be reduced, but scallop landings should increase. Lobsters may increase slightly in abundance, but conditions for holding lobsters in pounds will deteriorate. Shipworm damage to wooden structures will increase.

These changes will be brought about from the effects of changes in environ-

Fig. 1 - Passamaguoddy Fisheries Board and advisors. Photo taken at the January hearings; from left to right at the front table: Robert L. Dow, Maine Department of Sea and Shore Fisheries; Dr. Giulio Pontecorvo, Department of Economics, Bowdoin College, Maine, and Board members M. B. Pike, Lubec, Maine, Dr. J. L. McHugh, U. S. Bureau of Commercial Fisheries, and Dr. J. L. Hart, Fisheries Research Board of Canada. In the background, left to right, are W. F. Doucet, Canadian Department of Fisheries; Dr. R. W. Trites, R. A. McKenzie, and S. N. Tibbo, Fisheries Research Board of Canada; Dr. C. J. Sindermann and L. W. Scattergood, U. S. Bureau of Commercial Fisheries; D. F. Bumpus, Woods Hole Oceanographic Institution; and L. R. Day, Fisheries Research Board of Canada.

International (Contd.)

mental conditions. The project under consideration would create two pools, one of which would have an average water level about 6 feet higher than at present, the other about 5 feet lower. Because the filling gates will be closed during about three-quarters of the tidal cycle, water circulation will be reduced. Seasonal variations in water temperature will be greater, and surface waters will be warmer in summer, colder in winter. Average salinity of the surface waters will decrease. These changes will increase the amount of ice cover in winter. Dissolved oxygen in the deeper waters will be reduced.

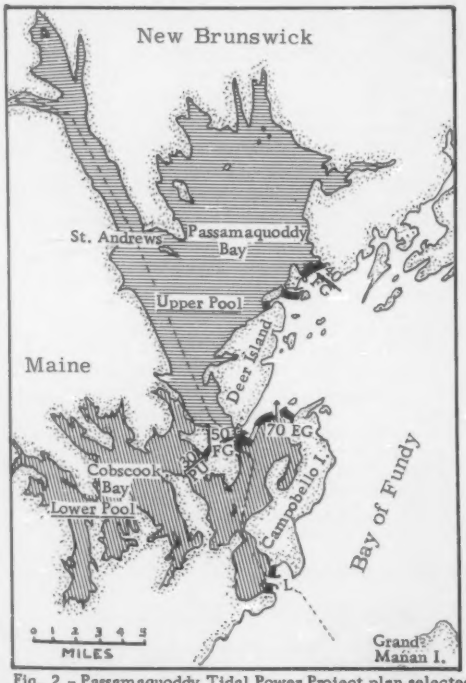


Fig. 2 - Passamaquoddy Tidal Power Project plan selected for detailed design.

The possibility of harnessing the power of the tides is a dream of long standing. Small tide mills were not uncommon along the Atlantic coast of North America in the last century but these were simple affairs, driven directly by tidal currents, and quite inefficient in their utilization of the available forces.

The Passamaquoddy project has been under serious consideration for more than 30 years, and the International Passamaquoddy Engineering Board has just completed a detailed study of the engineering and economic aspects.

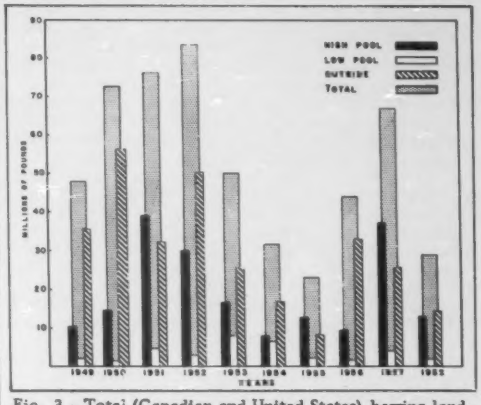


Fig. 3 - Total (Canadian and United States) herring landings in the high and low pools and in the part of the Quoddy Region outside the proposed dams.

Only a few places in the world have sufficient tidal rise and fall and suitable topography for practical utilization of the tidal power concept. The Bay of Fundy region, with the greatest tides in the world, is a particularly favorable spot. With completion of the Fisheries and Engineering Boards' studies, this project has become a serious possibility.

--J. L. McHugh, Chief,
Division of Biological Research
U. S. Bureau of Commercial Fisheries

Note: Also see Commercial Fisheries Review, April 1960, p. 38.

LAW OF THE SEA

SECOND CONFERENCE CONVENES:

The United Nations Conference on the Law of the Sea was convened at Geneva, March 17, 1960. The opening meetings were devoted to the election of officers, adoption of the agenda, and adoption of the rules of procedure. Prince Wan Waithayakon of Thailand was elected President by acclamation and Dr. Jose Correa of Ecuador was elected without opposition as Chairman of the Committee of the Whole. Max Sorenson of Denmark was elected Vice-Chairman of the Committee of the Whole and Edwin Glaser of Rumania, Rapporteur, Committee of the Whole. Representatives of the following countries were elected as Vice Presidents: Albania, Argentina, Canada, China, France, Ghana, Guatemala, Italy, Iran, Mexico, Norway, Poland, Switzerland, U. S. S. R., United Arab Republic, United Kingdom, and United States. These together with Prince

International (Contd.):

Wan and Dr. Correa form the 19-man Steering Committee. Representatives of the following countries were named to the Credentials Committee: Brazil, Chile, France, Greece, Indonesia, Liberia, Sudan, U. S. S. R., and United States.

The agenda was adopted without change. The rules of procedure were also approved but with certain amendments proposed by the Mexican delegation. Of these the one of some significance, which was opposed by the United States delegation, concerns the question of reconsideration of proposals in the Committee of the Whole. Voting on proposals in the Committee of the Whole is by simple majority. Proposals which receive such majority are referred to the Conference Plenary, where a two-thirds vote is required for adoption. Proposals which fail to get a simple majority in Committee are dropped from further consideration unless a motion to reconsider is approved by the Committee. The provisional rules of procedure had provided that a simple majority was required for reconsideration; the Mexican amendment, as adopted by a vote of 41 to 30 with 7 abstentions, requires a two-thirds vote.

Three proposals have been submitted to the Conference.

The Soviet Union proposed on March 21 that each state be entitled to fix the breadth of its territorial sea at any distance up to 12 nautical miles, and to have an exclusive fishing zone of 12 miles. If the territorial limit were set at less than 12 miles, the state might nonetheless have a 12-mile fishing zone.

Mexico proposed on March 21 that each state be entitled to fix the breadth of its territorial sea at any distance up to 12 miles. In addition, each state would have a contiguous fishing zone, the breadth of which would be determined according to a formula set forth in the proposal. Nations choosing a territorial sea of from 3 to 6 miles would be granted a contiguous fishing zone 12 to 15 miles wide, as the case may be, for a total of 18 miles; nations choosing a territorial sea of from 7 to 9 miles, a contiguous fishing zone 6 to 8 miles wide, for a total of 15 miles; nations choosing a territorial sea of from 10 to 11 miles, a contiguous fishing zone 1 to 2 miles wide, for a total of 12 miles; and nations choosing a territorial sea of 12 miles would be granted no additional contiguous zone.

Neither of these proposals makes any provision for continuation of traditional fishing activities of other states off foreign shores.

The United States proposed on March 23 a 6-plus-6 plan, in which the territorial sea would be fixed at 6 miles and an outer 6-mile contiguous fishing zone would be established. In the outer zone, nations which had traditionally fished off foreign shores in areas within the 6- to 12-mile band would continue to do so, for "the same groups of species. . .to an extent not exceeding in any year the annual average level of fishing carried on in the outer zone" during the five-year period immediately preceding January 1, 1958.

Presenting the U. S. proposal, Arthur Dean, chairman of the United States delegation, said that the United States feels that failure to reach any agreement at this Conference would be a "serious and unfortunate mistake." However, in order to reach agreement, we feel we "must refrain from pursuing our preferred solution," he continued.

"The solution preferred by the United States which we believe to be in the interest of all nations, large and small, is a width of 3 miles and no more. The United States prefers that there be no exclusive fishery jurisdiction beyond the 3-mile limit. Efforts to maintain and maximize fishery production, a highly desirable objective, have, we believe, little to do with arbitrary lines drawn by man in or on the ocean. . .

"I find it hard to believe the logic, and the basic self-interest of nations, large and small, maritime and not-yet maritime, fishing and not-yet fishing, do not weigh heavily on the side of continuing to maintain the traditional 3-mile limit.

"The United States adheres, has always adhered to this limit, and for this reason shall continue to do so if there is no agreement reached here."

The Department of State announced on March 11 that President Eisenhower appointed Arthur H. Dean, New York City, as Chairman of the United States Delegation, with the personal rank of Ambassador, to the Second United Nations Conference on the Law of the Sea.

Dean also served as Chairman of the United States Delegation to the first United Nations Conference on the Law of the Sea which was held at Geneva, February 24-April 28, 1958.

Arthur L. Richards, Special Assistant to the Under Secretary for Law of the Sea, serves as Vice Chairman to Dean.

The Department also announced that President Eisenhower designated the Honorable Edward T. Miller, former member of the House of Representatives from the First District of Maryland as Alternate United States Representative, and as an additional Vice Chairman of the Delegation.

The Congress was asked to designate two Congressional Advisers.

Other members of the Delegation include:

Alternate United States Representatives:

Oswald S. Colclough, Vice Admiral, U. S. N. (Retired),
Department of the Navy

William C. Herrington,
Special Assistant to the Under Secretary for Fisheries and Wildlife,
Department of State.

Arnie J. Suomela,
Commissioner of Fish and Wildlife,
Department of the Interior

David W. Wainhouse,
Minister-Counselor,
American Embassy, Vienna.

International (Contd.)

Raymund T. Yingling,
Assistant Legal Adviser,
Department of State.

Advisers:

Norman Armour, Jr.,
United States Mission to the United Nations,
New York, New York.

Frank Boas, Attorney,
Brussels, Belgium.

Wilbert M. Chapman,
Natural Resources Committee,
San Diego, California.

Ralph N. Clough,
First Secretary,
American Embassy, London.

George J. Feldman, Attorney,
New York, New York.

Leonard Hardy, Captain, U. S. N.,
Department of the Navy.

Wilfred A. Hearn, Captain, U. S. N.,
Department of the Navy.

Harold Hoag, Lieutenant Commander, U. S. N.,
Department of the Navy.

Nat B. King,
American Consul General,
Dacca, Pakistan.

Harold E. Lokken,
Manager, Fishing Vessel Owners Association,
Seattle, Washington.

John Lyman,
National Science Foundation.

William R. Neblett,
Executive Director,
National Shrimp Congress,
Key West, Florida.

Charles H. Owsley,
Deputy United States Representative at the
European Office of the United Nations and
Other International Organizations,
Geneva, Switzerland.

G. Etzel Pearcy,
Geographer,
Department of State.

Thomas D. Rice,
Executive Secretary,
Massachusetts Fisheries Association, Inc.,
Boston, Massachusetts.

Peter Roberts, Consul,
American Consulate General,
Seville, Spain.

Harry Shooshan,
Office of the Secretary,
Department of the Interior.

George H. Steele,
Director, Fishery Products Division,
National Canners Association,
Washington, D. C.

Fred E. Taylor,
Office of the Special Assistant to the Under
Secretary for Fisheries and Wildlife,
Department of State.

William Terry,
Fish and Wildlife Service,
Department of the Interior.

William Witman, II,
First Secretary,
American Embassy, Paris.

Edward E. Wright,
Office of the Special Assistant to the Under
Secretary for Law of the Sea,
Department of State.

Secretary of Delegation:

Virgil L. Moore,
Resident United States Delegation to
International Organizations,
Geneva, Switzerland.

Technical Secretary:

Ernest L. Kerley,
Office of the Assistant Legal Adviser
for United Nations Affairs,
Department of State.

The Conference undertakes to resolve two highly important problems left unsolved by the 1958 conference--the breadth of the territorial sea and fishery limits. Representatives from about 89 countries were invited to participate.

NORTHWEST ATLANTIC FISHERIES COMMISSION

FISHING TRENDS IN NORTHWEST ATLANTIC:

Canadian landings from the International Commission for the Northwest Atlantic Area were 9 percent higher in quantity in 1959 than in 1958. This was due to increased landings of cod and haddock, whereas ocean perch or redfish landings fell far below those of 1958. January 1960 compared to January 1959 showed a great increase in ocean perch landings and a somewhat smaller increase in cod landings, whereas haddock landings were far below those of January 1959.

Cod landings from the trawl and trap fishery in Newfoundland and from the trawl fishery in the Gulf of St. Lawrence were highly satisfactory during the 1959 summer. Off Labrador the summer fishery for cod yielded exceptionally good catches. During late summer, ocean perch which had been scarce returned in fair quantities in the Gulf of St. Lawrence. During autumn--in spite of unfavorable weather conditions, the Newfoundland fisheries

International (Contd.):

continued to consolidate their recovery from the very poor year of 1958.

The Faroese fisheries off West Greenland stopped in 1959 by the end of October. The catch was not satisfactory, partly because of bad ice and weather conditions, and partly owing to a scarcity of cod.

A joint Danish-Faroese-Norwegian fishing concern is planning a considerable development of its fishing plant in Faeringehavn, West Greenland, especially to meet the increased demand for fillets.

The third French campaign to the Northwest Atlantic was under way in October. The catches reported from the Labrador and West Greenland areas were, up to October, rather unsatisfactory.

The French trawlers started in January on the first trip to the Convention Area in 1960. About 32 trawlers are expected to take part in the fishery this year. In 1959 a total of 34 trawlers took part in the fishery. During the latter part of the year's fishery, a considerable increase in size of the cod caught in West Greenland waters was observed, and due to this a more satisfactory fishery is expected in 1960.

German trawl fishing mainly for ocean perch was carried out during the autumn of 1959 along the northeast shelf of the Newfoundland Bank with most satisfactory results, and with a catch per unit of effort about one-third higher than that from any other fishing grounds. The fishery was started in this area following an exploratory trip by a German trawler to the area between Flemish Cap and Labrador.

Norwegian hand-liners and trawlers returned from their last 1959 trip to the ICNAF area during October-November 1959. The fishery was carried out in West Greenland and in the Newfoundland area; off Greenland mainly for cod for salting with only insignificant catches of halibut; off Newfoundland as a mixed fishery for cod and halibut.

The last Spanish trawlers returned from the ICNAF area in December; the fishery in 1959 was reported as being better than in 1958. The 1960 campaign was expected to start at the end of January.

Russian exploratory trawlers in 1959 worked off West Greenland and found rich fishing grounds for cod and ocean perch on the banks and their western slopes between Kap Farvel and Disko Island. Data for preparing a fishery chart of the area were collected.

UNITED NATIONS

UNITED KINGDOM FIRST TO RATIFY 1958 CONVENTIONS ON TERRITORIAL SEA AND FISHERY CONSERVATION:

The United Kingdom has become the first country to ratify 2 of the 4 international conventions adopted by the United Nations Conference on the Law of the Sea in April 1958, the United Nations Office of Legal Affairs announced March 15, 1960. British ratifications of the Convention on the Territorial Sea and the Contiguous Zone, and of the Convention on Fishing and Conservation of Living Resources of the High Seas, have been received at U. N. Headquarters.

In addition, the United Kingdom's ratification of the Convention on the High Seas was received. It is the second ratification of this treaty, the first having come from Afghanistan.

Each convention needs a total of 22 ratifications to bring it into force. A fourth treaty adopted by the 1958 Conference on the Law of the Sea, dealing with the continental shelf, has not yet been ratified. It also needs 22 ratifications.

The Convention on the territorial sea embodies the results of work of the 1958 conference on that subject but does not cover the width of the territorial sea, which was considered at a second U. N. conference in Geneva on March 17. Among other things, this convention establishes specific rules for the right of innocent passage of ships through territorial waters, with separate references to merchant vessels, government-owned ships used commercially, and warships; and lays down the rights and duties of states through whose waters the ships pass.

In addition, regarding the "contiguous zone," the convention gives the right for each state to exercise controls regarding fishing, emigration, customs and sanitation within a 12-mile belt to prevent infringements of the territorial sea.

The Convention on the High Seas among other things, provides for freedom of the high seas; specifies that "states having no sea coast should have free access to the sea"; deals with the nationality and the flag of ships; regulates practices on the high seas, including such matters as assistance to ships in distress, piracy, and the "right of hot pursuit" of foreign ships; calls for measures to prevent the pollution of waters by oil or radioactive waste; and deals with the laying of submarine cables and damage to them.

International (Contd.):

The Convention on Fishing and Conservation establishes regulations on the conservation of fisheries on the high seas, seas, lays down rules under which measures promulgated by one nation are applicable to other countries, and sets out arbitration procedures.

Note: Also see Commercial Fisheries Review, February 1960, p. 61; November 1959, p. 100; August 1959, p. 40; February 1959, p. 49; January 1959, pp. 54 and 71.

TRADE AGREEMENTS

ICELAND-EAST GERMANY TRADE AGREEMENT INCLUDES FISH:

Iceland has concluded a new trade agreement with East Germany, which includes some fishery products exports from Iceland to East Germany. The new list does not mention the subject of fishing vessels which has been important among East German export items. The 1960 protocol had been under discussion for some time. The actual negotiations have been between the Icelandic Chamber of Commerce and the German Democratic Republic Chamber of Foreign Trade. Some of the talks were held September 21-22, 1959, in Berlin, but the 1960 protocol was signed November 20.

A decline is noted from the 1959 agreement in respect to salted herring. Last year's provided for 65,000 barrels, whereas the new agreement provides for only 50,000 valued at US$1.1 million. However, the possibility of purchasing additional herring is left open. By far the most important item in the agreement from the Icelandic side is the sale of at least 9,000 metric tons of frozen fish valued at $3.15 million. East Germany is apparently quite interested in purchasing Icelandic frozen fillets and also would have been willing to take more than the 2,000 metric tons of fish meal (valued at $340,000) provided for in the agreement.

Note: See Commercial Fisheries Review, January 1959, p. 54.

WHALING

WHALE OIL SALES:

The Norwegian whaling companies have reported to the press that 100,000 long tons of whale oil had been sold. The Norwegian marine oil processors have bought 40,000 tons, and 60,000 tons have been sold to a large British firm. The price was reported as £72 10s. (US$203) a long ton, or the same as the price paid by the British firm last year, but other unspecified conditions are reported to be more favorable for the sellers.

The press article includes reports on other sales of whale oil which have been made: 50,000 to 60,000 tons from Japan to the same British firm that bought the Norwegian oil; the total British production also was sold to the same British firm, with the exception of 8,000 tons which have been sold to independent buyers on the European Continent; Japan had previously sold 13,000 tons. The sales of Japanese and British oil to the British firm are reported at the same price as the price paid for Norwegian oil.

Total 1960 Antarctic whale oil production by the Norwegian expedition is presently estimated at about 120,000 metric tons, or roughly the same as in 1959. (United States Embassy, Copenhagen, report of March 11, 1960.)

* * * * *

NO WHALING IN CANADA THIS YEAR:

The British Columbia whaling fleet and land station will not operate this year. Some 60 men employed on the boats and 90 in the plant have been advised that the operation will be suspended. Hunting and processing normally commences in April and continues for six months.

At west coast Canadian whaling station skilled workers using flensing knives to strip off blubber. Giant calipers are used to measure whale.

International (Contd.):

It seems evident that the reason for not operating this year is the depressed world markets for meal and oil.

LATIN AMERICAN FREE TRADE AREA AGREEMENT

An agreement to create a Latin American Free Trade Area was signed on February 18, 1960, culminating an intensive two-week conference in Montevideo. Representatives from Argentine, Brazil, Chile, Mexico, Paraguay, Peru, and Uruguay signed. Bolivia, although participating fully in the negotiations, did not sign but was granted four months to do so and still be considered a founding member. The agreement--to be known as the Treaty of Montevideo--will enter into force when ratified by at least three of the contracting parties.

The Treaty includes several annexed protocols relating to: (1) norms and procedures for negotiating reductions in restrictions, (2) the establishment of a provisional committee to act for the Association until the Treaty is ratified, (3) the form in which ECLA and the Interamerican Economic and Social Council are to provide technical advice, and (4) an exemption from Treaty requirements for agreements among the signatories on the purchase and sale of petroleum. Two Conference resolutions were signed at the same time as the Treaty. One grants Bolivia its four months to subscribe to the agreement as a founding member while the other calls for an informal meeting of Central Bank experts to study possible payments arrangements. (United States Embassy, Montevideo, February 24, 1960.)

Argentina

FISHERY TRENDS, FEBRUARY 1960:

Shrimp Fishery: The shrimp fishery in southern Argentina was over by early February with landings down sharply from the previous season. Ex-vessel prices were higher, ranging between 10 and 60 pesos per kilogram (5.4-30.7 U. S. cents a pound) according to size. The shrimp failed to appear in quantity during the Argentine summer season. In the past, according to an article in an Argentine newspaper (La Prensa) of February 14, 1960, the shrimp vessels landed catches of up to 4 metric tons daily and landings were often limited because of the lack of processing capacity.

This past shrimp fishing season, severe weather along the coast curtailed the fishery from November 1959 to January this year. Fishing for shrimp in volume began about 1945 in the Comodora Rivadavia area and also about 28 miles off the Rio Chabut. Since 1947 landings have decreased and the drop is attributed by some to overfishing by the up to 50 vessels fishing the above areas.

Shark Fishery: In February the fishery for shark (cazon) had started and catches by the fleet averaged about 500 fish a day. These sharks were sold at 120 pesos (US$1.44) per fish, which is considered a good price.

Tuna Fishery: The Japanese tuna vessel Yoshino Maru landed at Mar del Plata on February 6, 1960, with its first trip from an Argentine port. The vessel landed 9,828 albacore, 931 yellowfin, and 103 big-eyed tuna, 2,467 swordfish, 1,697 white swordfish, 18 other swordfish, and 162 sawfish. Prior to this trip the vessel had landed a trip in November 1959, caught while en route to Argentina from Japan. Another Japanese vessel, the Eisei Maru, landed tuna and other fish at Mar del Plata in 1959. (United States Embassy, Buenos Aires, February 16, 1960.)

Australia

FISHING INDUSTRY PROTESTS MARKETING OF SMALL SHRIMP:

In January this year Australian fishermen and fish wholesalers united to protest the landing and sale of small shrimp (under $3\frac{1}{2}$-inches in length with heads on). The legal minimum sizes for shrimp were abolished by the Government in May 1959. At about the same time the mesh size for shrimp trawls was increased from $1\frac{1}{4}$-inch to $1\frac{1}{2}$-inch.

Australia (Contd.):

In abolishing the minimum size for shrimp the Government acted on the advice of its fisheries experts who claim that legal lengths have no conservation value since school shrimp don't spawn until 4½-inches long and king shrimp until 9 to 11 inches long.

The request to impose a minimum size limit on shrimp was made in a letter to the Chief Secretary's Department jointly signed by the president of the New South Wales Master Fish Merchants' Association and the secretary of the New South Wales Fishermen's Co-op Union Ltd.

The letter said: "At a meeting of the Committee of this Union with the Committee of the Master Fish Merchants' Association, it was decided that we voice our joint protest against the abolition of a legal minimum size of prawns and both bodies hereby express their desire that the Department immediately impose a legal minimum length of 3 inches on prawns.

"It is pointed out that with the recent glut of small prawns on the market it is the firm opinion of both bodies that a continuation of this policy will eventually lead to a reduced quantity of prawns being available for catch, and consequently the public will be excluded from prawn buying. Neither the Union of Fishermen's Co-operative, the buyers, nor the actual consumer desires that this small prawn be allowed on the market. (Fish Trades Review, January 1960.)

Brazil

JAPANESE FISHING COMPANY CLOSES BRAZILIAN RETAIL STORES TEMPORARILY:

The Japanese fishing firm, which has been operating out of Brazil since mid-1957, sold its landings of fish at retail through 14 sales units in the City of Sao Paulo.

The stands, small buildings with refrigerating facilities, were set up at strategic points throughout the city under a special two-year license granted by the city government. The license expired at the end of 1959 and was not renewed. As a result, the Japanese firm and its distributors shut down and dismantled the fish stands. The catch from the company's fishing operations off the coast of Brazil, which totals over 400 tons of fish monthly, is now sold to wholesalers. The Japanese firm is dissatisfied with this arrangement, inasmuch as it is no longer able to control prices at retail levels, and has decided to rent space for retail stores at the locations where the fish stands used to operate. The company was planning to have a total of 11 outlets operational in late March or early April.

According to an officer of the Japanese firm, the company is now considering selling part of its catch of fish to the newly-created Centro Estadual de Abastecimento S. A. (State Supply Center) when that organization sets up facilities in various parts of the State of Sao Paulo.

The Japanese company now has in operation the full complement of ten vessels. (United States Consular report from Sao Paulo, March 4, 1960.)

Canada

BRITISH COLUMBIA SALMON MIGRATION AND ESCAPEMENT DEVELOPMENTS 1959:

Developments or trends of special interest associated with the British Columbia 1959 salmon migration and salmon escapement include:

1. The low returns of chum salmon to northern coastal areas are of major concern. In some cases they are the poorest on record. Despite an almost complete ban on fishing, chum escapement to Queen Charlotte Islands was very light, generally less than the weak brood year and only slightly better than the light runs of 1955 on the east coast and a portion of the west coast of Moresby Island. Escapement to streams of the Butedale area was the poorest on record, and in the Bella Bella area where fairly good runs were experienced four years ago a decline in the number of spawners was evident this year.

2. On the other hand, some improvement in chum runs to the southern areas of the Province over the weak 1955 cycle year was quite generally in evidence. The volume of catch reflected this improved state and spawning ground supplies were much more satisfactory.

Canada (Contd.):

3. Pink salmon runs generally were substantially below expectations based on good spawning escapements two years ago. The Fraser pink run was the second smallest in the history of the fishery and where a return aggregating some 4 million fish was looked for on the Skeena, the actual run was of the order of 2.2 million fish. The lesser returns are attributed to adverse survival conditions at sea. The volume of catch at some points was curtailed because of the two-week tie-up of fishing gear during the period July 25-August 9.

4. The coho and spring salmon runs were of good average volume. This is reflected by catch statistics and spawning ground escapements. Both of these varieties continue as a major attraction in the province's rapidly expanding tourist and recreational fields in the southern coastal areas.

5. No large sockeye run was in prospect and returns were pretty much of the order anticipated with the exception of the Fraser where improved runs prevailed. The aggregate catch was appreciably reduced in volume by the two-week fishing tie-up during the last week in July and the first week in August.

Canadian purse-seiner brailing salmon out of the net.

6. Regulatory measures in the interests of conservation were the most stringent and restrictive on record. These could not have been unexpected having regard to the degree of high efficiency, mobility, and skills being maintained by present-day fishing fleets and the fact that at best only moderate returning salmon runs were in prospect.

British Columbia Salmon Catch, 1952-1959

Year	Sockeye	Pink	Coho	Chum	Red & White Spring	Steelhead	Jack	Total
	(Number of Fish)							
1959	3,259,600	6,776,300	2,896,900	2,015,200	868,000	13,500	80,300	15,909,800
1958	12,044,500	6,908,200	2,989,500	3,191,400	960,200	27,000	108,500	26,229,300
1957	3,036,000	11,310,400	3,136,700	2,412,000	828,400	16,800	109,700	20,850,100
1956	3,257,500	7,352,000	3,049,600	2,458,400	922,800	23,000	60,300	17,123,600
1955	2,835,500	11,246,500	2,970,000	1,567,600	786,500	23,500	85,500	19,515,100
1954	6,710,400	5,443,900	2,445,100	5,941,400	798,000	53,000	78,800	21,470,600
1953	5,926,700	11,110,000	2,894,000	4,670,000	943,400	43,100	70,500	25,657,700
1952	4,863,300	11,235,200	2,745,400	2,481,100	830,200	54,600	74,800	22,284,600

Canada (Contd.):

7. A significant development was the substantial catch gain in pinks made by trollers, particularly along the west coast of Vancouver Island, where the fish were still long distances from their spawning streams, and in the Alert Bay subdistrict. The trollers took 809,100 pinks or 11.9 percent of the total pink catch. In the Alert Bay subarea the troll pink catch comprised 20 percent of the subarea catch of this species. Because of the successful competitive effort with purse seines and gill nets in the Alert Bay area, trollers were required to observe special weekly closed seasons for a 3-weeks' period at the height of the pink run in common with the net fishermen.

8. Improved volume of chum salmon escapement to the spawning streams between Vancouver Island and the mainland and to the Harrison-Chehalis streams on the Fraser is directly attributable to the "four-ten" conservation formula, i.e., 4 days fishing followed by 10 days of closure, during the fall fishing season in all areas between Vancouver Island and the mainland, including Johnstone Strait, Gulf of Georgia, and Fraser River. A regular, progressive influx and distribution from the Johnstone Strait migration towards the many streams draining into the Straits of Georgia was attained and the enhanced spawning escapements should bear fruit four years hence.

Cuba

MEMBERS DESIGNATED FOR GULF OF MEXICO SHRIMP COMMISSION:

Three representatives of the Government of Cuba have been designated to serve on the Commission for the Conservation of Shrimp in the Eastern Zone of the Gulf of Mexico. The designation was made by the Ministry of Foreign Relations in Decree No. 2471, published in the Official Gazette No. 41 of March 1, 1960.

The members designated by the Cuban Government are Dra. Isabel Perez Farfante, Director of the Fisheries Investigation Section; Dr. Jose Acosta Jimenez, Biologist; and Rene Buesa Mas, Technician.

In accordance with the Convention between the United States and Cuba on the Conservation of Shrimp in the Gulf of Mexico, Cuba is responsible for designating three members for the Commission which is to be established to implement the Convention between the United States and Cuba.

The three United States members of the Commission have not yet been designated. The purpose of the Convention between the United States and Cuba is scientific research and the adoption of conservation measures affecting shrimp harvested by fishermen of both countries in the Gulf of Mexico off the coasts of Cuba and Florida, where important shrimp areas exist.

This is the ninth international agreement by means of which the United States is now cooperating with neighboring countries in the conservation of fishery resources.

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FOUR IMPORTANT FROZEN FISH PRODUCTS COMPANIES INTERVENED:

Four important Cuban private frozen fish products companies in Habana Province have been intervened recently, according to a March 4 report from Cuba. The interventions were accomplished by resolutions issued by the Fisheries Division of the National Agrarian Reform Institute (INRA) signed by a Naval Captain of that agency, a delegate of the Office of Cuban Maritime Development (Oficina de Fomento Maritimo Cubano), and the president of the Cuban National Fisheries Institute (Instituto Nacional de la Pesca).

The "Whereas" clauses of one of the intervention orders attempted to justify the above action by claiming that the establishment of fishermen's cooperatives at over 20 ports in the Island had forced the INRA to assume control of packing firms in anticipation of increased fisheries production. It was further charged that it was "common knowledge" that the fish and shellfish packing firm was functioning in an "abnormal" manner and "did not fully render the social and economic functions it should." The Naval Captain of the INRA also reportedly stated that the companies were working only one or two days a week.

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CLOSED SEASON ON SPINY LOBSTER AND BULL FROG SPECIES:

The Cuban National Fisheries Institute (Instituto Nacional de la Pesca) of

Cuba (Contd.):

the National Agrarian Reform Institute (I.N.R.A.) imposed a closed season on the capture of the spiny lobster species, Panulirus argus, effective March 15, 1960, and on the bullfrog species, Rana catesbeiana, effective April 1, 1960. The closed seasons will remain in effect until cancelled by subsequent I.N.R.A. resolutions.

The resolutions announcing the closed seasons appeared in the Official Gazette--that for spiny lobster in No. 42 of March 2, 1960, and that for the bullfrog species in No. 52 of March 16, 1960. Both were adopted upon the recommendation of the Director of the Fisheries Investigation Center. (United States Embassy, Habana, reports of March 11 and 23, 1960.)

Egypt

SHRIMP INDUSTRY:

Egypt's shrimp landings (heads on) have averaged about 5,318 metric tons annually for 1956-58. In 1959 estimates indicate landings were 450 tons higher.

The motor fishing fleet of Egypt consists of 157 vessels (excluding 329 vessels engaged almost exclusively in sardine fishing). The percentage engaged in shrimp fishing is not known. There are in Egypt no modern shrimp vessels of the type used in the United States. In addition, there are large numbers (perhaps 700-1,000) of small sailing vessels which are engaged part-time in shrimp fishing.

There are a number of plans, none of which have been implemented as yet, to either construct or purchase from abroad modern shrimp trawlers. Such plans do not call for more than 10 vessels during the next three-year period.

Shrimp exports are subject to the same currency control regulations as other Egyptian exports. There is no export tax on shrimp; there is, however, a quarantine inspection designed to assure the export of only wholesome products, the charge for which amounts to approximately $4.88 a metric ton. (United States Consulate, Alexandria, report of December 15, 1959.)

German Federal Republic

MARKET FOR FROZEN FISH AND OTHER FOODS EXPANDING:

The frozen-food industry in Germany has developed more slowly than in any other country in Western Europe. But it is now firmly established and progressing rapidly.

In 1955, after studying the frozen-food industry in neighboring countries and in the United States, the Germans attempted to establish theirs on a better basis. It caught on and since then has grown steadily. In 1956 there were only 5,000 deep-freezers in German stores. At the beginning of 1959 nearly 20,000 units, many of them much bigger than the first ones, were in operation throughout the country, though only about 10 percent of the grocery stores have them.

Comparing frozen-food consumption figures in certain other countries points up the great possibilities for expansion in the German market of 51 million people. Sweden, with a population of only seven million, has more deep freezers than Germany.

The number of firms turning out frozen foods in Germany is rising rapidly; in 1955 there were only 17 but by 1958 there were 42. Despite this substantial growth, German processors feel that production will not be able to keep pace with demand and that more and more frozen foods will have to be imported.

There are also production and distribution problems stemming from the newness of the frozen-food industry in Germany. The establishment of an efficient delivery chain from warehouse to shop has proven difficult, as has maintenance of uniform quality.

Table 1 shows the pattern of German frozen-food consumption in 1958.

Table 1 - West German Frozen-Food Consumption, 1958

Product	Metric Tons
Fruits and vegetables	6,000
Poultry	5,000
Fish	2,000
Ice cream	1,500
Prepared dishes, miscellaneous foods	1,500
Total	16,000

The 2,000 tons of frozen fish consumed in 1958 were principally in the form of fillets; the more popular kinds are cod, ocean perch or rosefish, sole, and plaice, though frozen shellfish is also being sold in increasing quantities. It is expected that the growth of the frozen-food trade will benefit particularly the fishing industry because inland consumers will be able to have fish year-round.

German Federal Republic (Contd.):

Table 2 -Imports of Frozen Fish Fillets, 1957-59

Country of Origin	Jan.-Sept. 1959			1958			1957		
	Quantity	Value		Quantity	Value		Quantity	Value	
	1,000 Lbs.	DM 1,000	US$ 1,000	1,000 Lbs.	DM 1,000	US$ 1,000	1,000 Lbs.	DM 1,000	US$ 1,000
Norway	1,802	658	158	701	310	74	523	177	42
Denmark	1	2	1/	7	6	1	57	39	9
Britain	-	-	-	54	69	16	4	2	1/
Sweden	-	-	-	29	19	5	-	-	-
Japan	-	-	-	11	7	2	9	6	1
Iceland	-	-	-	3	2	1/	2	2	1/
Netherlands	1	1	1/	3	2	1/	-	-	-
Communist China	-	-	-	2	2	1/	-	-	-
Other	-	-	-	9	-	-	-	-	-
Total 2/	1,804	661	159	819	419	100	595	226	54

1/Less than US$1,000.
2/Will not total since quantities less than $1,000 are included in totals.
Note: Values converted at rate of 4.17 Deutsche Mark equal US$1.

The import of most deep-frozen foods will be liberalized within the next one or two years and it is felt in trading circles here that it will be fairly easy to obtain import licenses during the intervening period.

Development of the frozen-food market has boosted the consumption of frozen fish, especially fillets. There is a strong interest in imported ocean perch or rosefish and cod fillets, and an indication that frozen shellfish would also be popular; those products have been liberalized. Principal foreign suppliers at present are the Scandinavian countries. (Canadian Foreign Trade, February 27, 1960.)

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NORTH SEA TESTS PROVE MERIT OF NEW MIDWATER TRAWL:

A new type of the one-boat midwater trawl has been judged suitable for commercial fishing after a year-long trial in the North Sea.

Promising catches of herring and sprat had been reported during experiments in 1959 with the new gear. The gear consists of a high-opening nylon net, hydrofoil otter boards, and an echo-sounder telemeter, with the oscillator attached to the head rope of the net for continuous trawl-depth position and fish detection. This new equipment allows fishermen a degree of accuracy in the operation far superior to former midwater methods.

The gear trials were conducted by the Hamburg, West Germany, Institute for Fishing Methods and Gear Research for the Government, at the request of the Society of German Deep Sea Trawler Owners. Most of the technical development and experimental work at sea was planned and supervised by a gear technologist on the staff of the Fisheries Division of the Food and Agriculture Organization (FAO).

Basically, the FAO expert states, the problem was to devise an economic way for the German trawler fleet to catch herring, sprat, or any other pelagic (midwater) fish swimming higher than the reach of bottom trawls. The main demand for such means came from the smaller deep-sea trawlers who are not able to reach the distant fishing grounds off Greenland, Newfoundland, and Labrador. Furthermore, it was desirable to extend the herring season throughout the year to supply the herring processing factories and the fresh fish markets. Herring trawling had heretofore been restricted to the yearly periods when herring were on the bottom.

Midwater trawling with two boats, with the net towed between them, is an accepted method among North Sea fishermen. However, the two-boat method requires close cooperation between the two crews, and becomes risky in crowded fishing grounds, and in bad weather. It also is unsuitable for larger craft.

The experiments with the new gear, for one-boat trawling, began in December 1958. The first trips were mainly devoted to the technical development of the gear, with the catch being considered relatively unimportant.

The basic problem in midwater trawling is to adjust the net accurately to the depth of the fish. This requires a continuous indication of the depth of the net (so that proper action can be taken in time) and gear which can be quickly raised or lowered as desired.

The quick manoeuvrability of the gear is obtained by the special design of the hydrofoil otter boards. The idea of the echo-sounder telemeter, which is now being put to commercial use for the first time, has been used experimentally by other scientific workers. The present experiments included the development of this method to commercial reliability.

The echo-sounder oscillator attached to the bosom part of the headrope to sound downwards indicates not only the depth of the net, but also the position of the ground rope and the fish in the net opening and below the net. The connecting cable to the echo-sounding unit in the wheelhouse of the trawler is handled on large craft by an automatic electric winch. This enables the fisherman to know the depth of the net, to check if the gear is operating properly, and to see if the fish are really in the path of the net. With some experience, he should also be able to estimate the rate of catch from the fish traces in the net opening and so determine the right time for hauling.

Eight trips were taken with trawlers of 150, 600, and 1,400 hp. to develop and test the new gear. Trawling was done in the North Sea, the English Channel, and the Irish Sea at a towing speed from 3.5 to 4 knots. The opening height of the net was between 10 and 17 meters (32.8-55.8 feet), in depths down to 200 meters (109.3 fathoms), and with warp lengths up to 375 fathoms. Catches ranged up to 7 metric tons per haul.

During a final 12-day trip with a large deep-sea trawler, in the English Channel and Irish Sea, the net burst with an estimated catch of 30 metric tons. Although most of this catch was lost, this trip yielded 100 metric tons, mainly of herring with small amounts of mackerel and coalfish. This catch sold in Germany for about US$14,500. This is not a tremendous catch for herring, the FAO expert stated. However, it was considered significant since the test was conducted prior to the early winter herring season, at a

German Federal Republic (Contd.):

time when bottom-trawling fishermen were catching hardly any herring.

The new gear is expected to become a valuable means of extending trawling to periods when the fish are off the bottom and beyond the range of conventional bottom trawls. This should lead to increased economy in trawling through fewer interruptions of fishing due to unsuitable fish distribution, better exploitation of fishing grounds, extension of certain fishing seasons, and even by making new areas and fish stocks accessible.

Ghana

MANY NATIONS FISHING OFF GHANA:

Ghana, in Northwest Africa, is reported to have obtained promising results in its investigations for expanding fisheries in its waters. Concentration is on tuna. The studies were carried out by a United States fishery firm in cooperation with the Government of Ghana.

In addition to Japanese long-line tuna vessels, Russian, Norwegian, and French vessels are also reported fishing off Ghana in the Atlantic. The Soviet Union is reported to have carried out mothership-type tuna fishing off Cape Verde.

A law prohibiting foreign fishing vessels to operate in the territorial waters of Ghana has recently been enacted. (Japanese Fisheries Economic News, March 4, 1960.)

Greece

FROZEN FISH PRODUCTION INCREASED:

Replying to a question put by a member of Parliament, the Greek Minister of of Industry stated that the production of frozen fish in Greece today reaches 5,000 metric tons and that it will reach 16,000-18,000 tons when all the freezer-trawlers under construction are operating.

The frozen fish will be used, on the whole, to meet Greek needs since local demand is good.

In January 1960, the freezer-trawlers Evangelistria I, Evangelistria II, Evangelistria III, Zephyros I, and Polikos worked off the coasts of Mauritania (Northwest Africa).

The freezer-trawler Polikos completed her maiden voyage fishing until January 20,1960--110 metric tons of fish were caught (average daily production 3.5 tons).

The new factoryship Evangelistria IV was expected to leave Cornebourg (Vienna) for Vraila, but was delayed because of bad weather.

Preparations have been made to complete another three freezer-trawlers in Viarezzio, Italy; and still another two freezer-trawlers (Alieia, February 1960).

Haiti

NEW FISHING COMPANY DEVELOPING FISHING INDUSTRY:

A new fish company is developing the fishing industry of Haiti with the aid of a Food and Agriculture Organization technical assistance fishery officer.

The main difficulty has been that up to now the Haitian fishermen have found it very hard to market their fish. There are very few paved roads in the country--the rest are jeep or mule tracks--which means that fresh fish never gets out of the coastal villages. What fish fishermen catch beyond their own needs, they salt and sell to professional trading women, known as Madame Sarahs, who come on donkeys over the mountains. These women pay the fishermen 5 to 7 cents a pound for their fish, and often buy on credit, rather than cash.

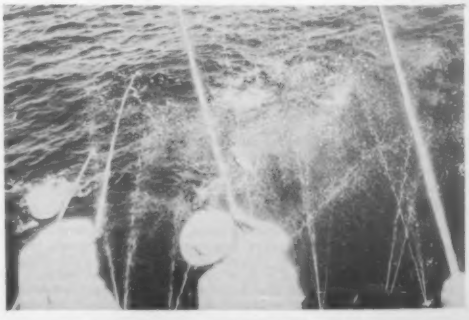

Fig. 1 - Cuban vessel Santona chartered by FAO fishery expert to explore tuna fishing possibilities. Fishing bonito with pole and line and using water spray to attract fish in waters near Haiti.

Haiti (Contd.):

The new company offered 10 cents cash a pound for fish. In one instance, the fishermen, in two days, landed 1,200 pounds of fish. Their previous production was 300 pounds a week.

A schoolmaster, recruited by the company to use his spare time buying fish, netted nearly the equivalent of his month's salary in two days of fish buying. His commission was one cent a pound.

The FAO expert from Canterbury, England, was sent at the request of the Haitian Government, to make a general survey of Haitian fisheries and proposals for fishery development. He decided on

Fig. 2 - Part of a day's catch of bonito aboard chartered vessel Santona. Fish have been eviscerated and washed and are about to be iced down in the hold.

two main lines of approach. First, to try and develop a large-scale industry for fish like tuna to increase the animal protein in the people's diets, and second, to help the small fishermen improve production by developing their fishing methods and providing them with a market. These aims were in accordance with the Government's policy of encouraging new enterprises.

Since Cuba, Haiti's next door neighbor, was landing some 12 million pounds a year of tuna, mostly bonito and albacore, the FAO expert thought that these fish could also be found in the waters around Haiti, although the local fishermen were not fishing for them. On the advice of the expert, the Haitian government chartered a Cuban bonito boat with a skeleton crew and the fishery officer went out and tested and plotted the tuna grounds to be exploited. A second charter of the same boat was to demonstrate the commercial possibilities. Although the vessel operated at the end of the season, nearly three-fourths ton of bonito a day was caught. A very simple fish-drying station was set up at Mole St. Nicolas, the bay where Columbus first landed, and the dried salted fish were sold to the Haitian people.

The new company fitted out the 45-foot boat bought from the Coast Guard--the first motorized boat ever to fish commercially in Haiti--with an insulated hold and small refrigeration unit, besides the gear necessary for bonito fishing. Then, to assure themselves of a continuous source of a variety of fish, they organized the fishermen in the scattered villages and began to collect fish from them. This April, the company plans to have its first try at the tuna.

To collect the fish, the company has established eight centers on the northern coast of Haiti's southern peninsula. There, its agents have started buying fish offered by the local fishermen, storing the fish in discarded domestic refrigerators packed with ice treated with antibiotics. The company's one boat has made regular rounds to deliver ice and to pick up the catch.

Now the new company has obtained a loan from the National Bank of Haiti, and a second Diesel-driven boat has been put into operation. This will enable the company to set up further collecting centers and permit fishermen in other outlying areas to sell their catch more profitably.

The new company has already opened three fish shops, one of which is particularly well equipped, in Port-au-Prince, Haiti's capital. All are clean and fitted with refrigerators. The company at present brings in roughly 3,500 pounds of fish a week, and this will increase as further centers are opened up and the company's newly-acquired cold storage goes into operation.

The company started exporting spiny lobsters, or crawfish, to the United States only last year. Now the company exports nearly 1,000 pounds of spiny lobster tails every two weeks.

Hong Kong

SHRIMP INDUSTRY:

Shrimp landings in Hong Kong in 1958, according to data furnished by the Fish Marketing Organization of the Cooperative Development Department of the Hong Kong Government, amounted to about 6.2 million pounds valued at US$1.5 million wholesale. Landings for the first six months of 1959 of 785,000 pounds (valued at $207,000) were down sharply from the 3.5 million pounds (valued at $668,000) landed in the same period of 1958.

Cost of Production for Export: No detailed information on cost of production for export is available. As of June 1959, frozen headless and deveined shrimp for export was valued at 51.5 U.S. cents a pound to point of shipment or f.o.b.

Exports: Shrimp exports prior to January 1, 1959, were included with other fresh and frozen shellfish (crustaceans and molluska). During 1958 a total of 6.6 million pounds (value US$3.8 million) of fresh and frozen shellfish were exported. For the first nine months of 1959, exports of fresh and frozen shrimp (exclusive of other shellfish) were only 774,000 pounds, valued at $515,000. The United States was Hong Kong's principal customer for fresh and frozen shellfish in 1958--shipments to the United States were about 4.1 million pounds, valued at $2.8 million, or about 63.1 percent of the quantity and 74.0 percent of the value of fresh and frozen shellfish exports. In addition to exports of frozen shrimp to the United States, some quantities of dried, salted, or pickled shrimp were shipped.

The U. S. Treasury Department in mid-1959 prohibited shrimp imports from Hong Kong because shrimp produced in Communist China was coming into the United States through Hong Kong. Thus exports of shrimp to the United States from Hong Kong ceased in June 1959.

Hong Kong (Contd.)

Table 1 - Hong Kong's Shrimp (Heads On) Landings and Wholesale Value and Average Price Per Pound, 1958 and January-June 1958-59

January-June 1959			January-June 1958			12 Months 1958		
Quantity	Value	Average Price	Quantity	Value	Average Price	Quantity	Value	Average Price
1,000 Lbs.	US$1,000	¢/lb.	1,000 Lbs.	US$1,000	¢/lb.	1,000 Lbs.	US$1,000	¢/lb.
785	207	26.4	3,494	668	18.5	6,201	1,491	24.0

Table 2 - Hong Kong's Exports of Shellfish, 1958 and Shrimp, January-September 1959

Country of Destination	January-September 1959 Fresh or Frozen Shrimp 1/		1958 Fresh or Frozen Shellfish		1958 Salted, Dried, or Pickled Shellfish	
	1,000 Lbs.	US$1,000	1,000 Lbs.	US$1,000	1,000 Lbs.	US$1,000
United States 2/....	514	365	4,139	2,796	94	99
Canada	88	43	960	329	60	47
Other	172	107	1,460	655	1,115	445
Total	774	515	6,559	3,780	1,269	591

1/Classification was changed on January 1, 1959, to separate shrimp from other shellfish.
2/Imports of frozen, dried, or otherwise preserved shrimp from Hong Kong to the United States in 1958 amounted to 4,029,143 pounds, valued at US$2,803,015, and in 1959 totaled 640,000 pounds, according to U. S. Customs records.

Export Controls and Taxes: As of 1959 there were no export controls or taxes on shrimp. (United States Consulate, Hong Kong, report of December 9, 1959.)

India

SHRIMP INDUSTRY:

The shrimp fishery of India has in the past been confined largely to the shallow coastal waters (chiefly South India) and the catches are mostly small immature shrimp plus smaller quantities of the larger sizes. Biological surveys by the Government have indicated that the older shrimp inhabit the deeper waters. Evidence pointing to the presence of such shrimp in deeper waters has been afforded by the catches of large shrimp by pilot fishing trawlers of the Indian Government. Increased mechanization envisaged under the country's Second and Third Five-Year Plans is expected to help develop marine fishing by extending operations far beyond the present limits, and to increase the volume and change the character of India's shrimp catch.

Landings: Despite the relatively primitive nature of India's shrimp fishery, landings are considerable. (Term "shrimp" as used includes prawns and lobsters and no differentation is made in the Government statistics.) According to official statistics, landings amounted to about 20,000 metric tons during the first three months of 1959 and the total for the year was expected to be close to the 1958 landings of 85,200 tons. The landings for 1957 were reported to be about 136,812 tons and for 1956 close to 159,600 tons. In addition to the ocean catch, considerable quantities are caught in lagoons, estuaries, and fresh water for which reliable statistics are not available. No statistics on the value of the shrimp catch are maintained.

Fishing Fleets: No data on the number of vessels solely employed in shrimp fishing are available because of the fact that the use of a fishing vessel in India generally is not confined to catching any particular species but catches many types of fish. In 1959 there were about 95,000 nonpowered and about 1,600 mechanized vessels in the marine fishing industry. The mechanized vessels are divided among the coastal states about as follows: 1,300 in Bombay, 200 in Kerala, 50 in Madras, 30 in Mysore, 25 in Andhra Pradesh, and 10 in Orissa.

High priority is being given to the mechanization of fishing vessels, establishment of vessel-building yards, the supply of improved fishing gear, and provision of shore facilities for handling

India (Contd.):

catches. The Third Five-Year Plan (1961-66) target for mechanized vessels has been tentatively placed at 5,000 vessels.

Prices: The Ministry of Food and Agriculture states that ex-vessel prices differ widely from place to place and the approximate average ex-vessel price of shrimp is about Rs.25 a hundredweight (5.25 U. S. cents a pound). According to the Bulletin of Agricultural Prices, the market prices of shrimp in October 1959, averaged about Rs.84.00 (US$17.64) per 100 pounds at Bombay and Rs.68 ($14.28) per 100 pounds at Madras.

India's Shrimp (Frozen, Canned, Dried, etc.) Exports, 1957-58 and January-June 1959

Country of Destination	Jan.-June 1959		1958		1957	
	Quantity	Value	Quantity	Value	Quantity	Value
	1,000 Lbs.	US$ 1,000	1,000 Lbs.	US$ 1,000	1,000 Lbs.	US$ 1,000
Burma . . .	1,887	572	7,374	2,583	9,473	2,935
United States . .	968	460	1,463	749	932	438
Ceylon. . .	383	86	918	203	611	152
Singapore .	98	32	102	31	408	43
Hong Kong	383	119	42	9	189	61
Other . . .	113	59	130	74	67	28
Total .	3,832	1,328	10,029	3,649	11,680	3,657

Note: Rupees converted at rate of Rs.4.730 equal US$1 for 1958 and January-June 1959, and Rs.4.750 equal US$1 in 1957.

Exports: Current export prices by types and sizes are not available, but export quantity and f.o.b. value statistics for the first half of 1959 indicate an average price of Rs.164 ($34.44) per 100 pounds, as compared to Rs.148 ($31.08) in 1957 and Rs. 172 ($37.16) in 1958. The average value of shrimp exports (includes frozen, canned, dried, etc.) to the United States has been considerably higher than the average for exports to all countries--Rs.223 ($46.83) in 1957, Rs.242 ($50.82) in 1958, and Rs.224 ($47.04) in January-June 1959 per 100 pounds. The composition of shrimp exports compared to total shrimp production accounts for the wide difference between average domestic market prices and average export prices.

Taxes: There are no restrictions on the export of shrimp. However, the Government levies a tax of Rs.0.75 (about 16 U. S. cents) per 100 pounds on all shrimp exported from India.

(Report of November 27, 1959, United States Embassy, New Delhi.)

Iran

JAPANESE-IRANIAN FISHERY ENTERPRISE AMONG FOREIGN INVESTMENTS APPROVED:

Among the foreign investment projects approved by the Iranian Government Foreign Investment Board is a Japanese-Iranian fishery enterprise. Activities of the firm consist of fishing and exploiting fish and other edible marine animals in the Persian Gulf and the Sea of Oman. The center of activity will be in Abadan. The Board of Directors consists of five members, three to be elected by the Plan Organization and the other two to be elected by the Japanese shareholders. The capital of the firm is 10 million rials (US$66,666), and it operates in partnership with the Plan Organization. Two-thirds of the total capital (the initial capital is 30 million rials) belong to the Plan Organization.

The Foreign Investment Board, the chairman of which is the Governor of the Bank Melli, functions under the authority of Article II of the Law on the Attraction and Protection of Foreign Capital Investment of November 28, 1955. (United States Embassy, Tehran, March 2, 1960.)

Japan

FISHING INDUSTRY PREPARING FOR NEW EXPORT YEAR:

With the Japanese 1960 fishery products export year beginning on April 1, the associations of exporters of fishery products and the Government agencies concerned are reviewing the 1959 record and making plans for export quotas and their allocation for the coming year. As far as the plans for exports have been revealed, they indicate a cautious holding of the line at or below last year's level.

Figures prepared by the Japanese Fisheries Agency for the use of the var-

Japan (Contd.):

ious consultative councils on exports show that in calendar 1959 the value of Japan's fishery exports was US$233 million, an increase of about US$12 million over 1958. Because of the great over-all increase in all of Japan's exports, however, the relative weight of fishery products in the total declined from 7.7 percent to 6.8 percent. In terms of value, frozen products accounted for 20.2 percent of fishery products exports and pearls for 10.4 percent, both showing slight gains, while the relative importance of canned goods, dried and salted products, and fats and oils declined.

Plans for 1960 exports, which are well along toward final determination, call for 2.28 million cases of canned tuna for the United States market, a cut of nearly 200,000 cases from last year's target. Exports of frozen tuna to the United States are slated to be held at or near the 1959 target levels of 30,000 tons of albacore and 30,000 tons of yellowfin to be shipped from Japanese ports. The quota for transshipments of yellowfin from the Atlantic to United States canners is set at 100 trips as compared with last year's target of 120 trips (which, as it turned out, was not even approached in actual performance). Prepared cooked tuna loins, which have been a troublesome item in the past, would have been increased to 4,000 tons, if the industry's early views had prevailed, but it now appears that last year's export level of 3,000 tons will be continued. Production of canned sardines for export is reportedly to be cut to 755,000 cases, about 100,000 cases under last year because of uncertain prospects in the Philippines, Japan's principal market. Canned crab-meat export sales plans call for continuation of the 1959 levels without important changes. (United States Embassy, Tokyo, report of March 18, 1960.)

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TYPE-OF-PACK RATIOS ESTABLISHED FOR CANNED TUNA:

A directors' meeting of the Japanese Export Canned Tuna Manufacturers Association held on February 29 agreed that more than 40 percent of the tuna packed in 1960 should be white meat as compared to 35 percent in 1959. As regards the can type, the current ratio of No. 1 cans 20 percent, No. 2 cans 50 percent, and 2-kilo (4.4 lbs.) cans 30 percent would be followed in packing white meat and a new ratio of No. 1 cans 15 percent, No. 2 cans 40 percent, and 2-kilo (4.4 lbs.) cans 45 percent would be followed for light meat. In 1959 the ratio for light meat was 15 percent No. 1 cans, 45 percent No. 2 cans, and 45 percent 2-kilo cans. (Japanese fishery periodicals of March 1, 1960.)

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PRODUCTION AND SHIPPING QUOTAS PROPOSED IN 1960 FOR FROZEN TUNA:

The Japanese Export Frozen Tuna Manufacturers Association held a directors' meeting on February 26 to determine Japanese production and shipping quotas for frozen tuna. The proposed quotas were to be presented at a general meeting planned for March 9, 1960. At the directors' meeting it was agreed to establish an "Atlantic Tuna Liaison Society" within the Association as a liaison group for those members who are engaged in Atlantic fisheries. The liaison

Japanese Production and Shipping Quotas for Frozen Tuna (Proposed for 1960 and Actual for 1959)

	1960	1959
Shipment quota for the United States (including Canada):		
Albacore	29,900 short tons	29,700 short tons
Yellowfin from Japan	30,000 " "	35,000 " "
Yellowfin transshipped from Atlantic	100 trips	120 trips
Tuna loins	2,980 short tons	2,980 short tons
Shipment quota for Italy	15,000 metric tons	12,000 metric tons
Broadbill swordfish for United States	4,500 short tons	4,500 short tons

Japan (Contd.):

group is to meet monthly to discuss random sales of Atlantic frozen tuna.

On frozen tuna loins, an application has been filed for licensing 4,000 short tons. On frozen broadbill swordfish, the quota is being restudied before the general meeting because there is a strong demand from some members to increase it to 5,000 tons. (Japanese fishery periodicals of February 27, 1960.)

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CANNED TUNA CONTROL ORDER:

On February 14, the Japanese Fisheries Agency held a meeting of the Export Fisheries Promotion Council to advise on the "Ministerial Order for the Control of Canned Tuna Sales Methods in the 1960 Export Year" and received the Council's approval of the draft order. The draft is essentially the same as the regulatory provisions approved on February 1 by the general meeting of the Export Tuna Canners' Association. Its immediate objective is to apply to "outsiders" the same restrictions on production and sales that apply to members of the Association. The Ministerial Order will be in effect from April 1, 1960, to March 31, 1961. (Nikkan Suisan Tsushin, February 15, 1960.)

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FIRM PLANS TO RAISE SHRIMP IN PONDS:

A Japanese corporation, with head offices in Tokyo, is building Japan's first hatchery and rearing plant for "kuruma" shrimp (Penaeus japonicus) in abandoned salt ponds at Takamatsu in Kagawa Prefecture. The complete rearing of shrimp from the egg to the adult stage is planned. The shrimp farm is also an example of a way to utilize abandoned solar-salt beds.

Japanese aquiculture in shallow marine waters has been expanding rapidly. According to the 1958 fishery census, if 1953 is taken as 100, the 1958 production index for "nori" (laver) was 147, and for oysters was 150. However, "kuruma" shrimp rearing has been an exception in that the increase in production has been slight. There are various reasons why shrimp rearing has not developed, but the principal ones are (1) the only source of young stock has been from natural spawning and it has been very difficult to obtain, and (2) the supply of rearing stock has been so limited that its price has been high. If seed shrimp could be obtained easily and cheaply, shrimp rearing would expand.

The president of the firm (former chief of the Research Division of the Japanese Fisheries Agency) experimented for more than 10 years at his laboratory in Chiba Prefecture on the complete rearing of "kuruma" shrimp and finally succeeded in complete artificial propagation from the egg to the adult stage. Since there were prospects for commercial success, he formed last September a corporation (capitalization ¥ 35 million or US$97,000) with the support of two large Japanese fishing companies. He plans to establish commercial facilities for hatching and rearing shrimp in abandoned salt beds on the Inland Sea of Japan. The company is planning also to supply larval and juvenile shrimp for rearing to coastal fisherfolk at reasonable prices. Thus the company's operations will aid the development of shrimp culture and contribute to the prosperity of coastal fishery enterprises by solving the problems of difficult supply and high prices of seed shrimp.

The old salt beds which the company is to use for shrimp rearing are located west of Takamatsu, close to the large consuming area of Kyoto, Osaka, and Kobe. The officers of the company made a personal survey of the old salt beds around the Inland Sea and decided that the 11 hectares (27 acres) of salt beds near Takamatsu was the most suitable place. The beds were purchased in January for ¥10 million ($28,000) and construction work was begun in February 1960 and is proceeding rapidly. According to the plans, the total construction cost will be ¥40 million ($111,000). Facilities will include 89,000 square meters (957,996 square feet) of rearing ponds, 1,800 square meters (19,375 square feet) of nursery tanks, sea-water intake and drainage lines, filtering installations, a 60-ton water tank in addition to the existing 300-ton tank, refrigerated storage, feed preparation shed, laboratory, office, and living quarters. Construction was scheduled to be completed by the end of March 1960.

The corporation will begin shrimp rearing in April. According to operating plans, the eggs will be taken from breeding stock in that month (300,000-700,000 eggs per spawner) and will be placed in hatching tanks with apparatus for regulating the temperature. It is now possible to hatch and rear as many as 10,000 shrimp. The larval shrimp will develop in nursery tanks until June, then will grow to adult size in rearing ponds, and the first shipments will be ready for market in the autumn. It is planned to produce about 25 metric tons in 1960. The scope of the facilities will be increased progressively, and plans call for production of 225 tons in the second year, 3,000 tons in the third year, and 10,000 tons in the fifth year. For the present, the shrimp will be put on the domestic market, but future plans call for export to the United States.

In order for any form of aquiculture to develop as a modern industry, it must have the following elements: (1) the organism to be reared must have a short culture period and have a high commercial value; (2) production in large quantities must be possible; (3) it must be possible to lower the cost of production by technical progress; and (4) it must be possible to lower production costs by large-scale production and still leave possibility for further expansion. Most of the forms of aquiculture practiced at present do not have these factors, and they are not therefore developing into modern industries. For example, "nori" (laver) culture is producing a fairly large harvest, but the form of business organization is undeveloped and the industry has developed simply as an aggregation of very small enterprises (largely as a part-time occupation of coastal fishermen or farmers). On the shores of the Inland Sea the rearing of yellowtail has developed very rapidly in recent years, but because of the rapid increase in facilities and production, supply has exceeded demand, the price has dropped, and this year there are many operators who are losing money. Rainbow trout rearing, which has undergone an astonishing expansion in inland waters, is limited by environmental factors related to the water supply and is not suitable for a large-scale industry. The plan of the Japanese shrimp corporation for complete rearing of shrimp has all of the necessary elements. At present the total production of cultured shrimp is only 150 tons.

All of the prefectures around the Inland Sea have been trying to find ways of utilizing the abandoned salt beds of that area. According to the Japanese shrimp corporation, out of a total of 1,400 hectares (3,459 acres) of abandoned salt beds, about 500 hectares (1,236 acres) offer the proper conditions for rearing "kuruma" shrimp. Just by turning the shrimp loose in the salt ponds, a production of 3.75 kilograms per hectare (3.3 pounds an acre) is possible. The corporation is encouraging the use of the abandoned salt beds for rearing shrimp, and plans to supply seed shrimp at reasonable prices. It is also offering its plans to the prefectures around the Inland Sea and to salt companies in the area, showing them how shrimp culture can offer a new use for the abundant unused land and disused salt beds around the Inland Sea coast.

Japan (Contd.):

The Japanese Fishery Agency has been working on its plans for developmental financing in the 1960 fiscal year. Included in the plans is a loan for the "kuruma" shrimp rearing facilities. Of the total capital of ¥52 million ($144,000), ¥20 million ($55,000) is scheduled to come from the Development Bank. (Nippon Suisan Shimbun, February 16 and 19, 1960.)

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FISHERY PRODUCTS EXPORTS, CALENDAR YEAR 1959:

At a February meeting of the Japanese Export Fisheries Promotion Council, the following data on Japanese fishery products exports in calendar 1959 were presented:

Product	1959		1958	
	Quantity	Value	Quantity	Value
		US$		US$
Frozen products	164,317 short tons	47,239,000	130,679 short tons	42,931,000
Canned tuna (48 No. 2 cans/cs.)	3,442,555 cases	26,936,000	3,035,910 cases	23,267,000
Canned salmon (96 No. 2 cans/cs.)	2,758,104 "	64,852,000	2,482,843 "	68,608,000
Canned crab meat (48 No. 2 cans/cs.)	760,663 "	15,115,000	681,758 "	12,814,000
Canned sardines (48 oval No. 1 cans/cs.)	629,710 "	4,756,000	687,789 "	5,237,000
Canned saury (48 oval No. 1 cans/cs.)	741,067 "	4,940,000	957,144 "	6,385,000
Other canned products	1,326,625 "	7,700,000	1,038,586 "	6,243,000
Salted and dried products	147,276 lbs.	5,716,000	204,176 lbs.	5,984,000
Fish and marine oils	103,564 metric tons	23,550,000	108,232 metric tons	25,302,000

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WINTER ALBACORE TUNA FISHERY TRENDS, FEBRUARY 1960:

Landings of winter albacore were good during late February in the Shizuoka District of Japan, but landings of other tuna, mostly big-eyed, dropped.

Buying by canneries (which had been packing mandarin oranges--season was over) and freezing plants had become brisk since about the beginning of February. Each day 50 to 100 tons were landed at both Yaizu and Shimizu.

The landed price once showed a slight decline, but as buying became active the price stiffened. At the end of February the ex-vessel price for albacore was ¥100-105 a kilo (US$252-260 a short ton) for prime fish and ¥80-90 a kilo ($202-226 a short ton) for marred fish. (Japanese fishery periodicals of February 26, 1960.)

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FORECAST ISSUED ON TUNA FISHING CONDITIONS IN PACIFIC:

The Kanagawa Prefecture Fisheries Experimental Station released the following forecast on tuna fishing conditions in the Pacific in April-May 1960. The quantity given is the expected catch for a set of 18,000 hooks.

In the East Pacific (5° N. lat.-10° S. lat., east of 150° W. long.): Yellowfin catch ratio is on the increase in the area between the equator and 5° N. lat., and although it will be low in April, in May it is expected to be 1.4 metric tons at the equator--2° N. lat.; 1.8 tons at 2°-3° N. lat.; and 2.3 tons at 3°-4° N. lat. Although yellowfin fishing is on the decline in certain areas, in the area of the equator--2° S. lat., and 4°-5° S. lat., the catch will be 1.8 tons more than other areas. Big-eyed tuna fishing is poor at 3°-5° S. lat., and on the decrease at 5°-7°, but catch is higher than surrounding areas with 2.3 tons at 3°-5° and 3.5 tons at 5°-7° in April, and about 2.3 tons in May.

In the Central Pacific (5°-20° N. lat., 170° E. long.-150° W. long.): In the area around 5°-13° N. lat., between the Mar-

Japan (Contd.):

shall Islands and Fanning Island, bigeyed fishing is nearing the end of its good fishing period, and although in the usual year catches of 1.6 tons in April and 0.8 tons in May are obtainable west of 180° long., and 2 tons east of 180°, in April this year 0.8 tons is the expected catch west of 180°, and 0.4 tons in May. In the area east of 180°, 1.2 tons are expected in April and 1.3 tons in May.

In the Central Pacific (5° N. lat.-10° S. lat., 170° E. long.-150° W. long.): In the entire area, yellowfin fishing is entering into a good fishing season. Around the Gilbert Islands catches are expected to be 1.6 tons in April and 2 tons in May. In its eastern area 3.2 tons are expected and around Christmas Island 2.8 tons can be expected. Also 2.8 tons are expected in the area of the equator--5° S. lat., between the area south of Christmas Island and south of the Gilbert Islands; 1.6 tons near 5°-10° S. lat., and west of 180°; and in the east, 2.4 tons are expected. South of the line connecting three points, i.e., 10° S. lat., and 170° E. long., the equator and 175° W. long., 10° S. lat., and 160° W. long., the albacore catch is expected to be high with 0.8 tons at the equator--5° S. lat., and 1.1 tons at 5°-10° S. lat.

In the Central Pacific (10°-30° S. lat., 170° E. long.-150° W. long.): Good albacore fishing prevails in the area 10°-15° S. lat., with 0.9 tons. Also albacore is on the increase between 22°-30° S. lat., and the catch is either about the same or more, with 0.9 tons in April and 1.1 tons in May. In the area between the south and north fishing grounds, fishing is expected to be poor with 0.5 tons. (Japanese periodicals of March 5, 1960.)

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FINANCING FOR FISH-MEAL OPERATIONS IN NORTH PACIFIC:

A number of Japanese fishing companies have been seeking 800 million yen (US$2.2 million) to finance their fish-meal factoryship operations in the North Pacific. As a result of conversations on January 28 between the Japanese Fisheries Agency and the Development Bank, it appears that a decision will soon be made to supply the 350 million yen ($972,000) requested by one of the fishing companies. The deciding factor in the firm's application was the fact that the tanker, which the company plans to buy from a Japanese oil company, was built with Development Bank financing and has already been partly paid for, so that the actual financing would amount to only about 120-130 million yen ($333,000-361,000). It looks as if the 300 million yen ($833,000) sought by another fishing company and the 150 million yen ($417,000) asked by a third company are out of the question for this year but will be recommended for inclusion in next year's financing for fish-meal factoryships. (Nippon Suisan Shimbun, February 5, 1960.)

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FISH MEAL REMOVED FROM LIST FOR TRADE LIBERALIZATION:

On January 29, the Japanese Ministry of International Trade and Industry removed fish meal from the list of items scheduled for liberalization after April 1960. Items scheduled for liberalization are placed on automatic allocation of foreign exchange for import.

The Ministry stated that the Peruvian fish meal price has dropped substantially, giving rise to fears that Japanese producers and fishermen would be adversely affected if imports increased.

Late last year in 1959 a Japanese trading firm contracted to import 4,500 metric tons of Peruvian fish meal, and it was loaded on January 16, for shipment to Japan. The meal was scheduled to arrive at Nagoya around the end of February. The purchase was made before the decision was made to remove fish meal from the list of items scheduled for liberalization.

Removal of fish meal by the Ministry of International Trade and Industry from the list of items slated for automatic allocation of foreign exchange has brought a feeling of relief to present North Pacific fish-meal factoryship operators--small producers as well as to big fishing companies. (Nikkan Suisan Tsushin, January 30, February 3 and 8, 1960.)

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Japan (Contd.):

EXPORTS OF PET FOOD IN 1959:

It is estimated that Japan sold about 450,000 cases of pet food to the United States in 1959. This is 10 times the exports in 1958 and represents 90 percent of initial predictions of 500,000 cases. About 90 percent was made from tuna and skipjack and the other 10 percent from saury or mackerel-pike.

Saury pet food, which was a new product introduced in 1959, has the advantage over tuna as far as the supply of raw material goes, and it is possible that it will greatly expand this year. However, according to informed sources, pet food made from saury is inferior in quality to that made from tuna. There is some uneasiness in Japan as to whether or not it will be accepted by consumers in the United States. (Nikkan Suisan Tsushin, February 11, 1960.)

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MACKEREL-PIKE FISHERY, 1959:

Japan's 1959 catch of mackerel-pike or saury was 518,679 metric tons, second in recent years only to the 1958 landings of 557,667 tons. Of the 1959 catch, 136,301 tons were landed in Hokkaido and 382,378 tons in the northern prefectures of Honshu.

Utilization of the 1959 catch was 35 percent for reduction, 31 percent for freezing, 22 percent for marketing fresh, 8 percent for canning, and miscellaneous uses accounting for the remaining 4 percent. The total 1959 saury oil production was 23,310 metric tons, and 38,328 tons of pressed scrap resulted.

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YELLOW SEA "TAISHO" SHRIMP CATCH POOR THIS YEAR:

Japanese "Taisho" shrimp fishing in the Yellow Sea, in contrast to last year's big landings, is really poor this year. One Nagasaki dealer who had 18 sets of pair trawlers in operation this season reports that whereas last year he got 40,000 cases (average 150 shrimp to the case), this season his boats landed only about 40 percent of last year's landings.

According to the Nagasaki Branch of another Japanese fishing company, it had 17 sets (34 boats) of trawlers working and got only about one-third of last season's landings of around 50,000 cases. Since the "Taisho" shrimp season runs only to the first part of March, it is certain that this season will be a poor one over-all. (Nikkan Suisan Tsushin, February 18, 1960.)

Republic of Korea

FUNDS EARMARKED FOR SOUTH KOREA'S FISHERIES:

The Combined Economic Board in South Korea in mid-March 1960 approved the release of counterpart funds for financing of irrigation projects, and also earmarked US$700,000 of International Cooperation Administration salable imports for fisheries supplies for South Korea's fishing industry.

According to data released by the South Korean Office of Marine Affairs, a total of $17 million of United States aid funds has been allocated for fisheries development since 1953. The money was about evenly divided between investment projects and imported supplies. The fishing industry suffered severe damages in the typhoon of September 1959, when nearly one-third of the total fishing fleet was destroyed. Second to housing, fisheries rehabilitation is receiving highest priority in allocation of typhoon relief funds. (United States Embassy, Seoul, report of March 18, 1960.)

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FISHING INDUSTRY HIT HARD BY TYPHOON:

The havoc of Typhoon Sarah which hit Korea in September 1959 is estimated to have cost the fishing industry fully one-fourth of the potential production of 1959. Out of a fleet of 37,000 fishing craft, 11,000 or nearly one-third were totally destroyed and numerous other vessels were damaged. With so many vessels out of commission during the fourth quarter, what is generally a highly productive season (especially for the an-

Republic of Korea (Contd.):

chovy and mackerel fisheries), 1959 marine production of 382,125 metric tons was off 3.3 percent from 1958 whereas developments before Sarah struck in September had warranted expectations of peak postwar output.

Despite the unavoidable decline in the production, 1959 exports of all varieties of marine products, valued at

Republic of Korea (Contd.):

US$4 million, were the highest since 1953. An unusually good crop this winter of laver (seaweed), which normally commands premium prices in Japan, portends continued progress of the marine-products category as an important earner of foreign exchange--assuming an early normalization of Korean-Japan trade relations, for Japan has been the sole purchaser of Korean laver and the major customer for all categories of marine exports.

Rehabilitation of the fishing industry is receiving high priority by a committee concerned with typhoon reconstruction. With over $1 million in United States funds and 681.5 million hwan ($524,000 at the rate of US$1=1,300 hwan) allocated by the Korean Government, it is planned to construct 8,453 small craft (under 5 tons). A long-term, low-interest loan program is enabling individual fishermen as well as the fishery cooperatives and associations to resume their operations. (United States Embassy, Seoul, report of March 3, 1960.)

Mexico

GUAYMAS SHRIMP FLEET TIE-UP SETTLED:

The Guaymas (west coast) shrimp fleet, other than cooperative-owned vessels, was tied up because of a labor-management dispute from mid-January to March 20, 1960. Information has been received that the dispute was settled and the fleet was scheduled to resume fishing on March 22.

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SHRIMP INDUSTRY TRENDS, FEBRUARY 1960:

An ex-vessel price increase in Ciudad del Carmen and Salina Cruz, the continued tie-up of the Guaymas fleet, bad weather in the Gulf of Mexico, and the threat of possible United States import duties or quotas on shrimp were the topics of conversation in the Mexican shrimp industry in February.

The National Chamber of the Fishery Industry held its annual meeting during mid-February at which it was decided to ask support of the Mexican Government to oppose proposed tariff or quotas on Mexican shrimp entering the United States.

The Guaymas (West Coast) fleet, other than cooperative-owned vessels, has been tied up since about mid-January and there were no signs in February of an early return to fishing. The landings being made at Guaymas are mostly small brown shrimp.

Mazatlan and Salina Cruz (both ports on West Coast) catches are reported to be holding up, although boat owners are grumbling about losing money. Toward the latter part of February, Salina Cruz ex-vessel prices were increased one U. S. cent a pound. This followed a five-cent rise a week earlier in Ciudad del Carmen (East Coast). Guaymas and Mazatlan prices did not change. Increased ex-vessel prices are not indicative of an improved market . They are the result of a local buyers' dispute and probably are only temporary.

Mexican Ex-Vessel Shrimp Prices, February 29, 1960

Size (No. Shrimp to Lb.)	Ciudad del Carmen (Brown and Pink)	Salina Cruz (Brown)
	(U. S. Cents a Lb.)	
10-14	63	-
Under 15	-	48
15-20	58	-
16-20	-	46
21-25	49	34
26-30	44	28
31-35	39	-
31-40	-	26
36-40	33	-
41-50	28	21
51 plus	-	16
51-60	22	-
61 plus	17	-

In both Ciudad del Carmen and Salina Cruz, the ex-vessel price of white shrimp was two cents a pound across-the-board more than for browns. Salina Cruz was landing mostly large browns. Most of the catch was under 20 count shrimp. A succession of "northers" in the Gulf of Mexico kept shrimp vessels in port for many days during February.

The Carmen landings-per-trip were about the same as in January, about 1,000 pounds of tails per trip. Campeche trips yielded less than during January and were about the same as those for Carmen. (The Carmen-Campeche landings per trip in January were reported to have been about 1.0 and 1.2 metric tons, respectively, but actually they were 1,000 and 1,200 pounds, respectively).

Carmen landings by species were the same as during January--about 50 percent pink, 35 percent white, and 15 percent brown. At Campeche the proportion of whites rose a bit to about 15 percent of the landings; pinks were about 85 percent; and browns were but a trace.

A greater proportion of smaller shrimp showed up in the Carmen February landings as compared with January. Only about 45 percent of the February landings were 30 count and larger, while in January 60 percent of the landings were in that category. Campeche landings also dropped in size composition from about 80 percent 30 count and larger during January to about 70 percent in February. (United States Embassy, Mexico City, report of March 4, 1960.)

Morocco

TRADE AGREEMENT WITH JAPAN INCLUDES FISHING ITEMS:

The Moroccan Bulletin Official of February 17, 1960, announced that the trade agreement of May 16, 1958, with Japan has been renewed. The renewal will extend from December 24, 1959,

Morocco (Contd.):

to December 23, 1960. The only items involving the fishing industry are exports of nylon and vinylon fishing nets (value $400,000), nylon and vinylon ropes (value $75,000), and plastic floats (value $50,000) from Japan to Morocco. (United States Embassy in Rabat reported on February 23, 1960.)

Norway

SUPPLEMENTARY SUBSIDY FOR COD AND HERRING FISHERIES APPROVED BY PARLIAMENT:

Supplementary appropriations of 22 million kroner (US$3.1 million) to subsidize cod and herring fisheries have been approved by the Norwegian Parliament. Of the total, 10 million kroner ($1.4 million) is earmarked for the northern provinces. (News of Norway, March 24, 1960.)

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STERN-FISHING TRAWLER TO BE BUILT FOR EXPERIMENTAL FISHING:

The Norwegian Ministry of Fisheries has proposed construction of a 150-foot-long stern-fishing trawler, to cost about Kr. 3.2 million (US$448,000), for experimental fishing in North Norway. The tests should provide conclusive proof whether it is more efficient to operate the trawl from the stern rather than from the side of the trawling vessel.

Meantime, a three-man committee, named to explore means of assuring the supply of raw material for fish filleting and freezing plants in Troms and Finnmark, has recommended construction of three stern trawlers, to cost Kr. 5-6 million ($700,000-840,000) each. If tests over a one-year period demonstrate their superiority over conventional side trawlers, the committee suggests it might be advisable to build up a fleet of 30 stern trawlers. This should provide enough fish to assure year-round operation and steady employment at all of the filleting and freezing plants in Troms and Finnmark.

A special type of stern trawler designed to meet Norwegian requirements has been extensively tested in the Ship Model Tank at the Norwegian Institute of Technology at Trondheim. The Bergen shipyard has developed an extremely efficient nozzle rudder, with built-in propeller, which looks very promising. At low speeds, the novel combination system provides 30 percent more thrust than a propeller alone, and better steering than a conventional rudder. (News of Norway, March 17, 1960.)

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WINTER HERRING FISHERY FAILS AGAIN:

The 1960 seasonal herring fishery off the coast of West Norway has failed for the third year in a row. When the season for the fat or high-priced winter herring was called off at midnight February 23, the total catch amounted to less than 200,000 metric tons. This is the poorest result since 1946 when fishermen landed only about 125,000 tons. The start of the spring herring fishery on February 24, automatically reduced the price per ton, because of lower fat content.

Only nine of the 450 purse-seiners which took part in the winter herring fishery managed to catch more than the 1,000-ton minimum required for profitable operation. The rest finished the season deep in debt for gear and other equipment. The herring were too deep to be reached by purse seine.

Meanwhile, the Norwegian Prime Minister told Parliament that the government will appoint a special committee to propose measures for remedying the damage caused by the fishery failure. The committee will also evaluate problems arising from the steadily diminishing influx of herring. (News of Norway, March 3, 1960.)

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HERRING FISHERY FAILURE IS GRAVE CHALLENGE TO INDUSTRY:

Failure of Norway's winter herring fishery should serve as a challenge to seek new fishing grounds and new operating methods, the Norwegian Fisheries Minister said in a recent address at Bergen. It is up to us, he stressed, to take advantage of the growing world demand for fishery products.

Norway (Contd.):

A strong plea was made for switching from purse-seiners to trawlers in the herring fishery. If fishermen show willingness to adopt new operating methods, he said the State would facilitate acquisition of larger engines and trawling gear.

Outlining a program for future development of the herring fishery, the Minister suggested that suitable purse-seiners, after installation of more powerful engines, should go over to trawling for herring in the North Sea, the Skagerak, the Norwegian Sea, and off Iceland. As a natural supplement to trawling, some of the purse-seiners might take part in the annual winter herring fishery off the coast of West Norway. Their participation, however, should be guided by biological and hydrographic conditions. Drift-netters, too, should seek out the herring in the open sea, thus becoming less dependent on shoals reaching coastal waters. From now on these operating methods should receive decisive consideration in building new fishing vessels, the Minister continued.

Equally radical suggestions were recently offered by a Member of Parliament and Director of the North Norway Development Fund. He urged year-round fishing activities, primarily to be conducted by ocean-going stern trawlers. In his opinion, this is the only way to provide enough fish for Norway's large frozen fillet industry. Now able to operate but a few months a year at full capacity for lack of raw material, filleting plants are in serious straits. Until Norway's own fishing fleet is big enough to assure year-round operation of the filleting industry, he suggested that foreign fishing vessels be permitted to land their catch for processing at Norwegian plants. In his opinion, this would be a sensible division of labor.

The Member of Parliament emphasized that industrialization of Norwegian fisheries must be accomplished without destroying chances for part-time fishing, which provides supplementary earnings for thousands of small farmers in North and West Norway. The main objective, he said, should be to extend the radius of operation, with far more vessels engaging in ocean fishing. Stern trawlers, 150-200 feet long, would be best suited for that purpose. These craft, however, are far too costly for most fishermen, unless they receive assistance from the State. Considering the vital importance of industrializing the fisheries, he felt such aid would be warranted. (News of Norway, March 10, 1960.)

Pakistan

ABOLITION OF DUTY ON FISHING EQUIPMENT AIDS PAKISTAN'S FISHERIES:

Following the abolition of duty on imports of fishing equipment, thus putting it on a par with agricultural equipment, the marine boat-building business boomed in the East Pakistan ports of Chittagong and Khulna.

In January, a fishing firm in Cox's Bazar started deep-sea operations, sending the catch to Chittagong in "cold-storage" vessels. Arrangements are being made for freezing, canning, and exporting of fish from Chittagong and Khulna. The first shipment of frozen shrimp from East Pakistan to the United States was announced in November.

A new East Pakistan fishing firm is likely to be formed with help of Japanese capital and technical assistance, according to an announcement made by the new Government Food and Agriculture Minister in Chittagong in January this year. (United States Embassy in Dacca, reported February 9, 1960.)

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DEVELOPING SHRIMP AND OTHER FISHERIES:

Pakistan exports of frozen shrimp to the United States have climbed from 150,000 pounds in 1956 to 471,000 pounds in 1957 and 637,000 pounds in 1958. Twelve commercial trawlers are under construction by private individuals. Previously no commercial trawlers were in operation in Pakistan.

Bidding on fish at wholesale market at Karachi.

Interest and enthusiasm in the development of fisheries resources is high both among Government officials and private individuals.

United States Operations Mission-Pakistan has, through its aid in constructing a modern fish harbor at Ka-

Pakistan (Contd.):

rachi and encouraging the exploitation of fishery resources particularly by the private sector, been instrumental in the recent expansion of the fishing industry in Pakistan. Since October 1959, when the fish harbor and market was officially opened, an average of 100 metric tons of fish have been auctioned daily through the market. (United States consular dispatch from Karachi, March 7, 1960.)

Portugal

FISHERIES TRENDS, 1959:

The situation in the Portuguese fishing industry remained unchanged during the fourth quarter of 1959 as compared with the preceding quarter, and although final 1959 statistics were not available as of the end of January 1960, the results of the year are comparatively poor. While the various types of fishing which supply fresh fish for local consumption, principally the trawl catch, had a satisfactory year, there was a decline in the sardine catch, and the cod season on the Newfoundland and Greenland banks is regarded locally as "disastrous." The cod fleet returned with only about a 60-percent capacity load and owners sustained large losses.

The bad weather which prevailed through Western Europe during the last quarter of the year took its toll in Portuguese fishing. Two trawlers collided and sank on October 22, with a loss of two lives. A large number of small fishing craft were damaged and a few lost, but the most serious economic effect was from the fishing days lost. For a number of days the weather at fishing ports was so rough that the Portuguese Coast Guard forbade fishing. While the total number of such days was not large, it was a serious matter for the fishermen, who have no savings to fall back upon.

The "Fund for the Renovation and Equipment of the Fishing Industry," the extension of which was reported earlier, was authorized a loan in November 1959, of 50,000,000 escudos (US$1,750,000) with which to continue its current operations.

The sardine catch through August was about 14 percent less than in 1958. The 1958 catch, however, was one of the largest on record, so the comparison is somewhat misleading. From trade and government information, however, it seems that the trend in the last four months of 1959 was downward, and that the 1959 catch will be lower than the recent average.

Exports of canned fish, chiefly sardines, anchovies, and tuna were at a high level in 1959, partly reflecting the abundant 1958 sardine catch. Through November, about 70,000 metric tons valued at $35.9 million were exported. Of these, about 76 percent were canned sardines. Portugal's anchovy exports to other European countries, notably France and Italy, increased significantly in 1959.

Portugal faces a difficult problem with its supply of dried cod this year. On top of a poor year in 1958/59, the 1959 catch is estimated to be even worse, and the supply of dried cod available in world markets is limited. After the late return of the fleet from the banks in the third week of October, and the confirmation of the poor catch, the Secretary of State for Commerce called a press conference on October 27, 1959, regarding the cod supply. The Secretary assured the press that existing ceiling prices would be maintained and that steps would be taken to ensure a regular supply of dried cod. However, an increase was permitted on December 16, 1959, in the prices of the highest grade only of domestic and imported dried cod. He stated, there was no need for hoarding and speculation would be promptly and rigorously punished. The Government has from time to time since October 1959 announced the release of quantities of dried cod to dealers. Nevertheless, stores have only barely adequate supplies, and the press has reported frequent instances of attempted hoarding by dealers, and of under-the-counter and tied sales. The Government, for its part, is apparently making its best efforts to sustain an orderly flow of this key product--at ceiling prices--to consumers. Since the shortage developed toward the end of 1959, and other countries with cod industries are concentrating more and more upon frozen fish, Portugal has been unable to obtain sufficient imported

Portugal (Contd.):

cod to take care of the shortage. Imports of dry and wet cod through November 1959 were 22 percent less than imports in the first 11 month of 1959, the United States Embassy in Lisbon, reported on January 27. 1960.

* * * * *

FISHERIES TRENDS, NOVEMBER 1959:

Sardine Fishing: During November 1959, the Portuguese fishing fleet landed 17,604 metric tons of sardines (valued at US$1,346,156 ex-vessel or about $76 a ton). In November 1958, a total of 26,767 tons of sardines was landed (valued at $1,603,930 ex-vessel or $60 a ton).

Canneries purchased 41.6 percent or 7,332 tons of the sardines (valued at $633,530 ex-vessel or about $86 a ton) during November 1959. A total of 10,044 tons was purchased for the fresh fish market, and 228 tons were salted.

Other Fishing: November 1959 landings of fish other than sardines were principally 3,340 tons of chinchards (value $156,730). (Conservas de Peixe, January 1960.)

* * * * *

CANNED FISH PACK, JANUARY-NOVEMBER 1959:

The total Portuguese pack of canned fish for January-November 1959 amounted to 56,142 metric tons. Canned sardines in oil (43,985 tons) accounted for 78.3 percent of the January-November 1959 pack, the January 1960 Conservas de Peixe reports.

Portuguese Canned Fish Pack, January-November 1959

Product	Net Weight	
	Metric Tons	1,000 Cases
In Olive Oil:		
Sardines	43,985	2,315
Sardinelike fish	617	32
Anchovy fillets	5,201	520
Tuna	4,424	158
Mackerel	582	23
Other species	1,333	71
Total	56,142	3,119

* * * * *

CANNED FISH EXPORTS, JANUARY-NOVEMBER 1959:

Portugal's exports of canned fish January-November 1959 amounted to 69,752 metric tons (3,801,000 cases), valued at US$35.7 million, as compared with 58,938 tons, valued at US$31.4 million, for the same period in 1958. Sardines in olive oil exported during the first 11 months of 1959 amounted to 52,906 tons, valued at US$25.6 million.

Portuguese Canned Fish Exports, January-November 1959

Species	Jan.-Nov. 1959	
	Metric Tons	US$ 1,000
Sardines in olive oil	52,906	25,597
Sardine & sardinelike fish in brine	1,449	302
Tuna & tunalike fish in olive oil	3,759	2,631
Anchovy fillets	5,899	4,325
Mackerel in olive oil	3,187	1,603
Other fish	2,552	1,232
Total	69,752	35,690

During January-November 1959, the leading canned fish buyer was Germany with 15,115 tons (valued at US$7.6 million), followed by Italy with 9,628 tons (valued at US$5.4 million), United States with 6,758 tons (valued at US$4.6 million), Great Britain with 6,755 tons (valued at US$3.1 million), and Belgium-Luxembourg with 4,507 tons (valued at US$2.2 million). Exports to the United States included 2,464 tons of anchovies, 944 tons of tuna, 3,135 tons of sardines, and 40 tons of mackerel. (Conservas de Peixe, January 1960.)

South-West Africa

DISPUTE OVER WAGES FOR SPINY LOBSTER FISHERMEN SETTLED:

The dispute over higher wages for 300 Portuguese spiny lobster fishermen in Luderitz, South-West Africa, was settled in February. Details of the final settlement are not known. The fishermen were seeking an increase from 9 shillings (US$1.26) per 100 pounds of spiny lobster landed to £1.4.0d. ($3.44). Other payments received by the fishermen were not involved in the dispute. These include a bonus of 3-4 shillings (42-56 U. S. cents) per 100 pounds, wages of up to £50 (US$140) a month, and a food allowance of £8-£10 per month (US$22.40-28.00).

Sweden

EUROPEAN COMMON MARKET CREATES EXPORT PROBLEMS FOR FISHERY PRODUCTS:

In the light of the development towards increasing exports which the Swedish fishing industry has shown in the last years, it is natural that most of the problems for commercial fishermen are on the international level, said the Swedish Minister of Agriculture in a speech on March 18 which was "Fisherman's Day" of the Agricultural Week.

The minister also said that apart from normal risks, which always exist because of the technical and economic development, the largest risk arising out of West German's connection with the European Common Market seems to be that this group gradually will introduce a common outer customs barrier. According to present plans, this would in a few years cause increasing sales difficulties for Swedish fish to West Germany, or seriously reduce the profit for that part of the fishing industry concentrating on this market. However, this development, the minister stated, is very difficult to judge.

The minister said further that in the Convention of the European Free Trade Association (EFTA), the special regulations pertaining to fishery are limited to a general aim. The purpose, he said, is to ease the development in the trade with fish and similar products, which give other member countries, whose economy is depending on such export, a reasonable reciprocity. The abolishment of customs protection, he said, affects the duties on canned fish products, and as respects frozen fish fillets, the EFTA Convention gives a certain room for increased Swedish export. From this point of view, he said, the EFTA Convention is more advantageous to the Swedish fishing industry than the proposed Nordic market, where the import fees would have been abolished immediately. The EFTA Convention, on the other hand, provides for a gradual abolishment over a ten-year period. (United States Consulate in Goteborg, reported on March 22, 1960.)

* * * * *

TEN STEEL TRAWLERS ORDERED FROM EAST GERMAN SHIPYARD:

A Goteborg firm has signed a contract with a shipyard in Brandenburg, outside of East Berlin in East Germany, for delivery of 10 steel trawlers. The trawlers will be of a special type, called "Schwedenkutter" (Sweden cutter), each with a total length of 104 feet and a width of about 22 feet. They will be equipped with 560-horsepower 4-stroke Diesel engines and will also have radar, echo-sounding devices, and radiotelephones. Two 16 kilowatt generators will furnish each trawler with electricity for heating and cooking purposes. Auxiliary motors of 28 horsepower will also be installed. The loading capacity is 1,500 boxes of fish.

Deliveries are scheduled to be made during a period of one year with the first trawler completed in the beginning of 1961.

The transaction, which represents an amount between 5 and 6 million crowns (US$965,000-1,158,000) provides for increased export of Swedish fish to East Germany. A contract for export of 2,000 metric tons of North Sea herring during the month of July and 500 metric tons of mackerel has been signed.

The background to the order for the ten steel trawlers is that Sweden's export of fish to East Germany in the last years has been rather irregular. In October 1959 for instance, export of fish to East Germany stopped because Sweden had discontinued importing fodder products, brown coal, and grain from East Germany as provided for in the global compensation arrangement for 1959. As a result of the uncertain export opportunities, Swedish representatives for the fishing industry sought to find other products that Sweden could import from East Germany. There is at present a demand for modern steel trawlers in Sweden. Several orders have been placed outside of Sweden, for instance in Holland. No orders, however, have previously been placed in East Germany by Swedish fishermen. However, it is reported that Danish fishermen have contracted for a similar type trawler for delivery in the summer of 1960.

Sweden (Contd.):

The company that has contracted for the trawlers is canvassing Swedish fishermen seeking to obtain sales contracts for the ten steel trawlers. (United States Consulate, Goteborg, report of March 8, 1960.)

* * * * *

FISHERY LANDINGS IN 1959:

The total catch of Swedish fishermen in 1959 totaled 260,000 metric tons, valued at 163,000,000 crowns (US$31.5 million), compared with 238,000 tons (revised), valued at 154,000,000 crowns ($29.7 million) in 1958. This set new records both for quantity and value.

West coast fishermen landed 75 percent of the total quantity and 70 percent of the total value. South coast fishermen accounted for 14 percent of the quantity and 16 percent of the value, and the share of the east coast fishermen amounted to 11 percent of the quantity and 14 percent of the value.

The increase in quantity originates from the west coast; the increase on the east coast was significant, while the landings by south coast fishermen dropped by 2,200 tons.

The value of the landings by west coast fishermen increased by 7,400,000 crowns ($1.4 million); the value for east coast fishermen increased by 400,000 crowns ($77,200) and the landings by south coast fishermen represented a gain of 1,200,000 crowns ($231,600). The increase in value on the south coast, despite the reduced landings, is explained by increased landings of more expensive fish, such as eel.

In comparing total landings as far back as 1939 with 1959, it is noticeable that the catch during the 20 years has increased by more than 200 percent. In 1939, west coast fishermen landed 75,000 tons as compared with 192,000 tons in 1959; south coast fishermen landed 12,000 tons in 1939 as against 36,800 tons in 1959; east coast fishermen landed 32,000 tons in 1939 compared with 27,800 tons in 1959.

During the same period the number of full-time fishermen dropped from 13,600 to 9,500. The catch per fisherman in 1959 is three times as much as in 1939. Larger boats with powerful engines, modern and more efficient gear, and new fishing methods account for the largest part of the increase, but a more intensive use of craft and gear is also a factor.

Exports of fish and fish products in 1959 also reached a new record and totaled 122,000 tons, valued at 76,500,000 crowns ($14.8 million). Direct landings in foreign ports, included in the above total, amounted to 80,000 tons, an increase of 17,000 tons and 7,000,000 crowns ($1.4 million) compared with 1958.

Imports of fish and fish products in 1959, dropped to 47,300 tons, valued at 105,400,000 crowns ($20.3 million), compared with 49,200 tons, valued at 105,900,000 crowns ($20.4 million), in 1958. (United States Embassy, Goteborg, report of March 15, 1960.)

Note: Values converted at rate of one Swedish crown equal $0.193.

Taiwan

FISHERIES LANDINGS IN 1959:

The 1959 fishery landings in Taiwan reached 246,327 metric tons, an increase of 7.25 percent over 1958 landings of 229,677 tons. The catch by categories as compared with 1958 is shown in the table.

Taiwan's Fishery Landings, 1957-59

Type of Fishery	1959	1958	1957
	(Metric Tons)		
Deep-sea fisheries	76,411	61,160	52,223
Inshore fisheries	91,240	81,720	71,552
Coastal fisheries	32,183	38,267	38,468
Fish culture	46,493	48,530	45,878
Total	246,327	229,677	208,121

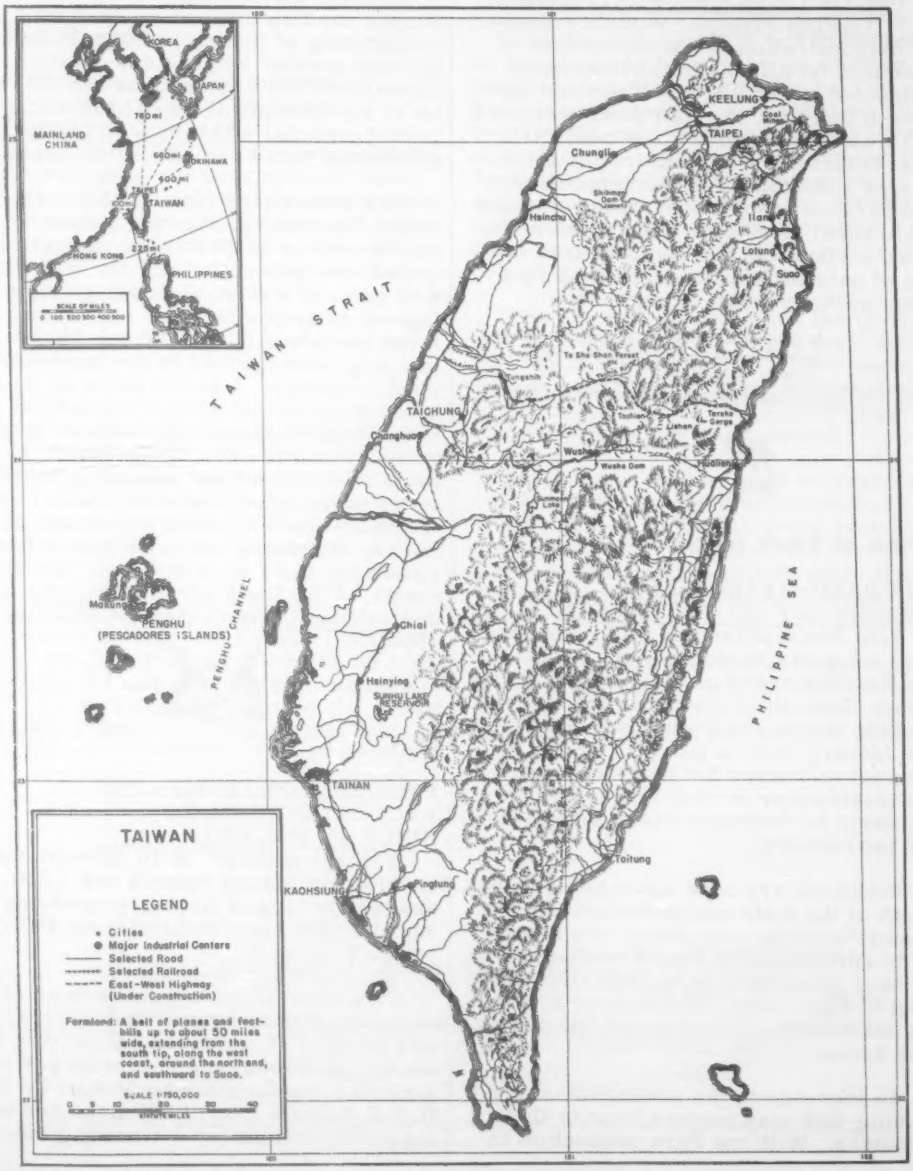
Over 70 percent of the 1959 production was contributed by the deep-sea and inshore fisheries and the remaining 30 percent by coastal fisheries and fish culture. This is in contrast to the production of 1952 in which the deep-sea and inshore fisheries accounted for only 40 percent of the total catch. The drop in

Taiwan (Contd.):

landings from the coastal fisheries is attributed to the motorization of many sampans which placed them in the inshore fisheries. Fish-culture production in 1959 was set back by the serious flood of August 7.

The 1959 fishery catch exceeded the planned goal of 242,000 tons. The new goal set for fisheries production in 1960 is 255,000 tons.

OUTLOOK FOR TUNA FISHING BRIGHT: Encouraged by the successful operation of the four 350-ton tuna long-



Taiwan (Contd.):

liners built in 1957, the fishing industry is planning the construction of two 550-ton tuna boats in 1960. Export of frozen tuna to the United States amounted to 688 tons in 1959 as compared to 146 tons in 1958.

USE OF CHEMICAL FERTILIZERS IN MILKFISH PONDS: With the successful demonstration of the application of chemical fertilizers in milkfish ponds conducted by the Taiwan Fisheries Research Institute, the fish-pond operators in Taiwan have applied to the local Fertilizer Distribution Administration for a total of 1,505 tons of ammonium sulphate and 587 tons of superphosphate. The use of chemical fertilizers has proved to be more economical and sanitary than the use of natural fertilizers such as rice bran, soybean meal, or night soil.

--By T. P. Chen, Chief, Fisheries Division, Joint Commission on Rural Reconstruction, Taipei, Taiwan.

Note: See Commercial Fisheries Review, April 1959, p. 90.

Union of South Africa

PILCHARD-MAASBANKER FISHERY OFF TO GOOD START: Both Maasbanker and pilchards have been caught in reasonable quantities in the first six weeks of the Union of South Africa Cape shoal fishing season. According to reports from some factories, the January total is likely to be one of the best on record for that month, and the maasbanker or jack mackerel fishing early in February was a hopeful sign for the canners.

Pilchards are once again being found south of the main concentration of processing factories; the shoals are reported to spread over a wide area and catches have been made from near Dassen Island to False Bay. Maasbanker are being taken in the Saldanha and Lambert's Bay areas.

An increase in the proportion of good canning fish may prove a boon to Cape factories. With the Peru production in 1959 adding nearly 20 percent to world fish meal output, the export price has taken a drastic plunge and may be some time recovering. The price drop is serious, but, like other raw materials, fish meal could gain from it, according to the South African industry.

For the Union, South-West Africa, and Angola the fish meal price drop may cause a tightening of fishing industry belts and an even greater emphasis on economy in fishing and processing. Hard as this may be at the moment, it could have a long-term beneficial effect both on producers and on the world demand for their product.

In the ten years from 1948 to 1957 world fish meal production soared from 96,900 tons to 523,200 tons. Demand has grown with production and the high nutritive value of fish meal is being increasingly realized by farmers and animal feeds manufacturers. But the market has only been touched in the more developed countries. A fall in price could bring in more buyers and the surplus of today could become a shortage of tomorrow as Peru reaches the limits of its production. Consumers coming in at the lower prices may stay with the increase which will have to come if fishermen and factory operators are to receive a fair return for their work and their investments. (The South African Shipping News and Fishing Industry Review, February 1960.)

U. S. S. R.

FISHING MOTHERSHIPS AND FACTORYSHIPS TO BE BUILT BY POLAND: A "large number" of 10,000-ton motherships for fishing vessels and 1,250 deadweight tons of fishing-processing vessels have been ordered from Poland by the U. S. S. R.

This information appeared in an article in the Polish periodical Trybuna Ludu of February 29 which announced that Polish shipyards had received the largest single order thus far placed in Poland by the U. S. S. R. for a total of 122 ships amounting to 830,000 tons for construction during

U. S. S. R. (Contd.):

1961-1965, i.e., the period of the next Polish five-year plan as well as the five-year Polish-Soviet Trade agreement, which was expected to be signed soon.

United Kingdom

GOVERNMENT TO AID HERRING FISHERMEN WHEN CATCHES SOLD FOR FISH MEAL:

In the House of Commons of the British Parliament, the Secretary of State for Scotland was asked if "he was aware of the falling price of fish meal brought about by excessive and unrestricted imports of Peruvian fish meal; and what steps he is taking to protect herring fishermen, whose catches frequently go to fish meal, from bearing the losses involved."

The reply was that the Secretary was aware that the increase in the production of fish meal in Peru has had a considerable effect on the world market for fish meal. This has affected the operations of the Herring Industry Board, which has informed the Government of its difficulties.

Pending a full review of the situation, the Board has been told that, if necessary, the Government will meet its losses on its oil and meal arrangements up to £30,000 (US$84,000) during the period January 1-May 31, 1960, so that during that period the schedule of prices which the Board pays to the fishermen for surplus herring which is sold for reduction may be maintained. (Report of March 17, from United States Embassy, London.)

* * * * *

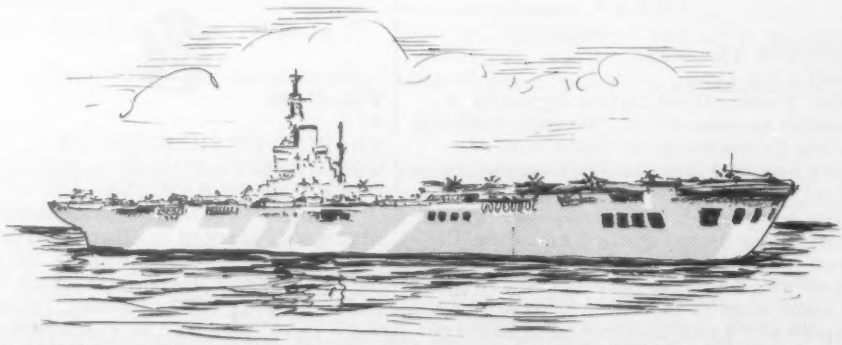
AIRCRAFT CARRIERS AS FISHERY FACTORYSHIPS:

Two aircraft carriers are to be used as factoryships to service the British deep-sea trawling fleet. The carriers have been purchased, along with an old repair ship, by a British company formed in London. Behind the venture is a firm of shipbrokers and managers, which has been working on the project for nearly a year. Capital amounting to more than £2.5 million (US$7 million) is behind the plan.

The aircraft carriers are the Ocean and the Theseus, both 13,000 tons, and the repair ship, Ranpura (16,000 tons). Equipment from the latter will be used in the conversion of the carriers and thereafter she will be scrapped.

Helicopters will be used to transfer catches from trawlers to the motherships, each of which will make four 90-day round trips in a year. On board the motherships the fish will be quick frozen. Products will be sold to distributors on a contract basis.

The firm estimates that 50 trawlers will be required to service each carrier. Trawler owners seem to realize that the plan is an excellent one and that it would



The 13,000-ton aircraft carrier Theseus to be used as factoryship to service British deep-sea trawling fleet.

United Kingdom (Contd.):

allow their vessels to spend more time on the fishing grounds.

In addition to acting as factoryships, the carriers, each with a complement of 425, will act as servicing ships supplying the catching vessels with fuel, ice, and other requirements. They will have what are described as "shore amenities" for the trawlermen.

The trawlermen's trade union has been consulted on matters affecting pay and conditions. (The Fishing News, February 19, 1960.)

Venezuela

RESEARCH ON SARDINE STOCKS PLANNED:

A British marine fisheries biologist is working in Venezuela on a year's assignment for the Food and Agriculture Organization in order to assist the Government of Venezuela to set up a research program to investigate the stocks of sardines and other commercial fish found in the Gulf of Cariaco and in other Venezuelan waters.

The present thriving sardine fishery in Venezuela produces fish for the canning factories and it is hoped that the research program will be able to determine to what extent the fishery may be developed without danger to the stocks.

* * * * *

FISHERIES TRENDS, FEBRUARY 1960:

The Venezueland Banco Agricola y Pecuario announced in February that the Fishing Cooperative of Zulia will receive a loan of 1.5 million bolivares (about US$485,000) for housing, nets, and other fishing equipment. The principal objective of these loans, according to the Director of the Bank, is to reduce the price of fish and help the small fisherman. The Bank also is planning to organize a cooperative of fishermen in eastern Venezuela which will also receive a credit of 1.5 million bolivares.

The new marine biology institute will be inaugurated in the near future on the island of Margarita to study (1) Venezuela's fishery resources, (2) the importance and possibility of modernization, (3) the possibility of new employment sources, and (4) the possibility of lowering the cost of living by introducing fishery products.

Wholesale trawling by the large commercial fishing and canning companies again came under attack from small fishermen in December 1959. The latter claim that trawling is depleting their fishing grounds and thus affecting their livelihood. The government, on the other hand, felt it necessary to extend its permission another four months (until April) for trawling in certain areas of Venezuela's seacoast. Otherwise, a spokesman said, a fish shortage would occur and 3,000 employees in the industry would be without work. The government believes that one answer to the problem is the fishing cooperatives which would permit the small fisherman to compete with trawling gear.

The first 50 tons of tuna were delivered by Japanese fishing boats to a Venezuelan cannery during July 1959. The boats belong to a joint Venezuelan and Japanese company (majority of capital is Venezuelan). The company expects to deliver 30 tons of tuna to the Margarita cannery every 10 days. The cannery expects ultimately to supply the entire Venezuelan market at prices no higher than imported tuna. (United States Embassy in Caracas reported in a depatch dated February 15, 1960.)

Viet-Nam

REARING OF MILKFISH ON COMMERCIAL SCALE DEVELOPING RAPIDLY:

The pond rearing of milkfish (chanos), which was started in Viet-Nam late in 1958, on a commercial scale, is developing rapidly in Central and South Viet-Nam. During 1959 two rearing stations were developed by the Fisheries Directorate and over 100,000 milkfish fry were captured for rearing purposes. In 8

Viet-Nam (Contd.):

months, 10,000 fry will yield about 6 metric tons of prime marketable fish.

A number of privately-owned commercial rearing ponds have now been built and others are under construction this year. All are designed similar to those built by the Inland Fisheries Culture Service.

As surveys reveal additional areas of fry concentration in coastal brackish waters, up to a million milkfish fry may be captured by 1962.

In Taiwan, where the rearing of milkfish has been conducted for the past 30 years, it is the most important pond fish and is one of the leading food fishes.

The magnitude of the Taiwan milkfish industry may be judged by noting that between 90 and 100 million fry are captured annually for pond-rearing purposes with 118 million being the record catch. The pond-rearing area exceeds 13,000 hectares (about 32,123 acres).

Pilot-rearing stations established during 1959 indicate that the vast mangrove swamp area of coastal Viet-Nam is admirably suited for milkfish rearing. The limiting factors will be the ability of the Fisheries Directorate to discover sufficient milkfish spawning areas and the development of techniques for catching them in volume, the United States Overseas Mission to Viet-Nam reported on February 18, 1960.

TESTS SHOW FISH AVOID FATIGUE

Encouraging results have been obtained relative to the degree of fatigue fish experience during lengthy ascents of fishways. In the summer of 1959, tests were conducted by U. S. Bureau of Commercial Fisheries biologists to examine the ability of salmonoids to make extended ascents of fishways with slopes of 1 on 8 and 1 on 16. These ascents ranged from 200 to 1,000 feet. Whole blood extracts were obtained from each fish immediately following the exercise period. These samples were then analysed.

In general the results imply that salmonoids do not become excessively fatigued in the ascent of either a 1 on 8 or 1 on 16 slope fishway even when the height achieved is up to 1,000 feet.

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FEDERAL ACTIONS

Committee for Reciprocity Information

1960 CONSULTATIONS ON FOREIGN IMPORT RESTRICTIONS:

The Committee for Reciprocity Information (CRI) has invited public views on the use of import restrictions by other countries which hamper the trade in United States products. Consultations are to be conducted during 1960 under the General Agreement on Tariffs and Trade (GATT) with the following member countries which have imposed restrictions for balance of payments reasons:

May 1960	July 1960	October 1960
Austria	Finland	Australia
Brazil	France	Burma
Denmark	Ghana	Ceylon
Greece	Israel	Chile
India	Norway	Indonesia
Malaya	Sweden	Japan
Uruguay	Turkey	New Zealand
	Yugoslavia	Pakistan
		Rhodesia/Nyasaland

The consultations will afford the United States an opportunity to discuss moderation of particular policies and practices of other countries that have proved unduly burdensome to United States exporters.

United States firms or associations having an interest in exporting to the consulting countries may, as a result of their experience, have information which would be useful to the United States Government in the consultations. Such information as (1) import restrictions causing unnecessary damage to commercial interests, (2) complex and arbitrary licensing procedures, (3) inadequate information available to traders on import regulations, or (4) discrimination in the treatment of goods available from the United States in favor of goods from other countries, is useful.

Written statements concerning problems caused by import restrictions in the countries listed were to be submitted to the Committee for Reciprocity Information, Tariff Commission Building, Washington 25, D. C. Statements were due April 15, 1960, for those countries consulting in May; May 15, 1960, for those countries consulting in July and are due August 15, 1960, for those countries consulting in October.

Department of Health, Education, and Welfare

FOOD AND DRUG ADMINISTRATION

A NUMBER OF REGULATIONS REGARDING FOOD ADDITIVES ISSUED:

The food additives amendment to the Federal Food, Drug, and Cosmetic Act (secs. 409, 701, 72 Stat. 1785, et seq.; 21, U.S.C. 348, 371) became effective on March 6, 1960, according to a statement of policy issued by the U. S. Food and Drug Administration and published in the December 31, 1959, Federal Register. However, this date may be and has been extended on a product-by-product basis for a time not to exceed 12 months "on the basis of a finding that such extension involves no undue risk to the public health and that conditions exist which necessitate the prescribing of such an additional period."

This means that hundreds of chemicals now found in foods must be approved by the Food and Drug Administration before they can be used. Law applies to all food chemicals introduced prior to January 1, 1958. Prior to that time any substance could be added to food and it couldn't be banned unless the Government proved it harmful. Now the chemicals may be used only if their manufacturer or promoters prove to the Food and Drug Administration that they are harmless. Food and Drug already has issued a number of orders listing food additives or substances generally recognized as safe, and other orders regarding food additives.

In the Federal Register of November 20, 1959, a list of about 185 substances that are generally recognized as safe was issued. This order indicated that it is impracticable to list all substances that are generally recognized as safe for their intended use. However, by way of illustration, the Agency regards such common food ingredients as salt, pepper, sugar, vinegar, baking powder, and monosodium glutamate as safe for their intended use. Also listed were certain chemical preservatives, buffers and neutralizing agents, emulsifying agents, nonnutritive sweeteners, nutrients, sequestrants, stabilizers, anticaking agents, etc. Most of the chemicals or substances listed are used to improve the color, flavor, texture, appearance, nutritional value, and keeping quality of foods. The order became effective on December 20, 1959.

A list of about 70 spices, seasonings, essential oils, oleoresins, and natural extractives that are generally recognized as safe for intended use, appeared in the January 19, 1960, Federal Register. This order became effective upon publication.

A list of substances and chemicals supplementing the list published in the Federal Register of November 20, 1959, was proposed and published in the Federal Register of February 2, 1960. The proposal listed certain substances generally recognized as safe within the meaning of the Act, and interested persons were requested to present their views. Included were certain chemical preservatives, buffers and neutralizing agents, nonnutritive sweeteners, nutrients, stabilizers, anticaking agents, etc.

The use in foods of certain additives for which tolerances have not yet been established or petitions therefor denied was authorized by an order published in the Federal Register of February 27, 1960. The listed additives may be used in food, under certain specified conditions, for a period of one year from March 6, 1960, or until regulations shall have been issued establishing or denying tolerances or exemptions from the requirement of tolerances, in accordance with the Act. Effective upon publication. In the Federal Register of March 5 a correction to the order issued in the February 27 Federal Register appeared. The correction corrected the listing of certain items.

Chemicals and substances (about 67 items) used in manufacture of paper and paperboard products for food packaging were listed in a proposal issued and published in the Federal Register of March 1. The substances listed in the proposal were those generally recognized as safe and those migrating to food from paper and paperboard products used in food packaging. Interested persons were requested to submit their views.

In the Federal Register of March 17 an order appeared extending the time during which certain container-lining ingredients may be used. The order authorizes continued use of lining ingredients comprising all categories of materials entering into lining formulations, insofar as they may be food additives, on the ground that no imminent risk to health is involved and that additional time is needed to appraise the entire list. Also involved is the consideration that a minimum quantity of any of the materials will be imparted to food, consistent with good manufacturing practices. Effective on publication.

Also in the March 17 Federal Register appeared an order extending the effective date for certain specified food additives as direct additives to food and certain additives as indirect additives to food. Became effective on publication. Also in the same issue was an order authorizing the use in foods of certain additives for which tolerances have not yet been established or petitions therefor denied, specifically substances migrating from adhesives used in food packaging. Effective on publication.

A notice appeared in the Federal Register of March 19 filing a petition for a regulation establishing tolerances for calcium disodium (ethylenedinitrilo) tetraacetic acid in cooked, canned shrimp and crab meat. Also in the same issue appeared a notice filing a petition for a regulation establishing tolerance for 66 nylon resin and 610 nylon resin in food-handling equipment other than for milk.

A notice appeared in the Federal Register of March 23, filing a petition for a regulation providing for the use of vinylidene chloride polymer dispersion-coated cellophane films in food packaging.

A notice appeared in the Federal Register of March 25, filing a petition for a regulation to provide for the use of sources of radiation-producing X-radiation at energy levels of 300 kv.-peak, or lower, for the purpose of inspection of foods, food packages, and for controlling food processes.

Many regulations affecting food additives are being issued in accordance with the recent changes in the Federal Food, Drug, and Cosmetic Act. Those interested in complete details should write directly to the Food and Drug Administration, Washington, D. C., or directly to the local office of that Agency if one is located in your area.

* * * * *

PETITION FILED FOR REGULATION ON TOLERANCES FOR CHEMICAL USED IN CANNED SHRIMP AND CRAB MEAT:

A petition has been filed with the U. S. Food and Drug Administration for issuance of a regulation establishing tolerances for calcium disodium (ethylenedinitrilo) tetraacetic acid in cooked, canned shrimp and crab meat, pursuant to the provisions of the Federal Food, Drug, and Cosmetic Act. Petition filed by a Port Royal, S. C., fishery firm proposes a tolerance of 180 parts per million (0.018 percent) of the chemical when added to cooked, canned shrimp for the intended purpose of controlling struvite formation, discoloration, and softening; and a tolerance of 200 parts per million (0.020 percent) in cooked, canned crab meat for the intended purpose of controlling struvite formation and discoloration.

The notice of the filing of the petition appeared in the March 19 Federal Register.

Department of the Interior

FISH AND WILDLIFE SERVICE

SEASON CHANGED FOR LAND-BASED WHALING FOR BALEEN WHALES:

The six-months season for land-based whaling for baleen whales by United States nationals and whaling enterprises has been changed by the Secretary of the Interior. The change, as it appeared in the Federal Register of April 6, 1960, shows that the opening date of the season has been advanced two weeks and the closing date has been advanced two weeks. This change was requested by the industry to take advantage of relatively better weather conditions during the early spring. Any resulting increase in the take of whales will be too small to affect significantly the conservation of the whale resources.

Section 151.20 (Whale catchers attached to land stations taking baleen whales) has been amended as follows: "It is forbidden to use a whale catcher attached to a land station for the purpose of taking or killing blue whales or minke whales,

except during the period April 16 to October 15 following, both days inclusive."

The Whaling Convention Act of 1949 authorizes the Secretary of the Interior to adopt such regulations as may be necessary to carry out the purposes and objectives of the Convention for the Regulation of Whaling. In accordance with that authority, the Secretary on April 12, 1956, issued whaling regulations to give effect to Articles V, VII, VIII, and IX of the Convention as they apply to nations and whaling enterprises of the United States.

Treasury Department

BUREAU OF CUSTOMS

CLARIFICATION ON APPLICATION OF TARIFF ON FISH BLOCK IMPORTS:

Recently the U. S. Bureau of Customs classified a shipment of imported fish fillet blocks containing only whole fillets of groundfish under Tariff Paragraph 717(b), the category under which groundfish fillets are dutiable. The latter part of 1959, a New York Customs Court's decision (Lee Herrmann Company A/c The Coldwater Seafood Corporation vs. United States) ruled that imported fish blocks made from groundfish are dutiable under Tariff Paragraph 720(b) instead of under Paragraph 717(b) under which groundfish fillets are dutiable. This decision became effective September 15, 1959.

However, under the most recent decision of Customs in classifying the shipment of fish blocks indicated above, all imports of fish blocks, for further processing, must contain a reasonable amount of bits, pieces, and trimmings. It has been indicated that 2 percent of bits, pieces, and trimmings will satisfy the Bureau of Customs. This means that Customs interprets the decision of the Customs Court in the case cited above as requiring the presence of some bits and pieces in order for the blocks to be classified under the 1-cent-a-pound (when weight of contents together with immediate container is 15 pounds or more) or duty provisions of Tariff Paragraph 720(b). Blocks not containing the required amount of bits and pieces will be classified under the fillet provisions of Tariff Paragraph 717(b) at 1-7/8 cents and 2-1/2 cents a pound.

Note: Also see Commercial Fisheries Review, Jan. 1960 p. 95 and Dec. 1959 p. 102.

* * * * *

GROUNDFISH FILLET IMPORT TARIFF-RATE QUOTA FOR 1960:

The reduced-tariff-rate import quota on fresh and frozen groundfish (cod, haddock, hake, pollock, cusk, and ocean perch) fillets and steaks for calendar year 1960 is 36,533,173 pounds, the Bureau of Customs announced in the March 2 Federal Register. Divided into quarterly quotas this means that 9,133,293 pounds of groundfish fillets and steaks during each quarter of 1960 may be imported at the 1-7/8 cents-per-pound rate of duty, and any imports over the quarterly quota will be dutiable at the rate of 2-1/2 cents a pound.

The reduced-rate import quota for 1960 is 1.0 percent less than the 1959 quota of 36,919,874 pounds. From 1951 to 1960 the quantity of fresh and frozen groundfish fillets permitted to enter the United States at the reduced rate of duty of 1-7/8 cents a pound has increased 24.7 percent.

Reduced-Tariff-Rate Import Quota for Fresh and Frozen Groundfish Fillets, 1951-1960

Year	Quota
	1,000 Lbs.
1960	36,533
1959	36,920
1958	35,892
1957	37,376
1956	35,197
1955	35,433
1954	33,950
1953	33,866
1952	31,472
1951	29,290

Average aggregate apparent annual consumption in the United States of fresh and frozen groundfish fillets and steaks (including the fillet blocks and slabs used in the manufacture of fish sticks, but excluding fish blocks since September 15, 1959, and blocks of fish bits) for the three years (1957-1959) preceding 1960 was 243,554,489 pounds, calculated in accordance with the proviso to item 717(b) of Part I, Schedule XX, of the General Agreement on Tariffs and Trade (T. D. 51802). This was less than the average consumption of 246,132,491 pounds for 1955-56, and also less than the average of 249,170,004 pounds consumed in the 1954-56 period.

A decision by the United States Customs Court in 1959 held that fish blocks imported in bulk are dutiable at one cent a pound under Tariff paragraph 720(b). Prior to that decision, fish blocks were classified under paragraph 717 (b), the same as fish fillets. The change became effective September 15, 1959, and fish blocks imported in bulk since that date have been classified under paragraph 720(b). Therefore, fish blocks imported since the effective date have not entered in the calculation of apparent annual consumption or the quota since only imports under 717(b) are considered in the calculation. In view of this, it is estimated that if fish blocks had remained under the 717(b) classification, apparent annual consumption for 1957-1959 would have been greater than that for the previous three-year period, and also the quota for 1960 would have been greater than that for 1959.

Note: Also see Commercial Fisheries Review, April 1959, p. 104.

* * * * *

U. S. IMPORTS OF CANNED TUNA IN BRINE UNDER QUOTA PROVISO FOR 1960:

The quantity of tuna canned in brine which may be imported into the United States during calendar year 1960 at the 12½ percent rate of duty is limited to 53,448,330 pounds. This is 2.1 percent more than the 52,372,574 pounds in 1959, 19.6 percent more than the 44,693,874 pounds in 1958, and 17.6 percent more than the 45,460,000-pound quota for 1957. Any imports in excess of the 1960 quota will be dutiable at 25 percent ad valorem.

Any tuna classifiable under Tariff Act paragraph 718(b)--fish, prepared or preserved in any manner, when packed in airtight containers. . . (except fish packed in oil or in oil and other substances;. . . .)--which is entered or withdrawn for consumption is included.

A proclamation (No. 3128), issued by the President on March 16, 1956, gave effect to an exchange of notes with the Government of Iceland to withdraw tuna canned in brine from the 1943 trade agreement and invoked the right to increase the duty reserved by the United States in negotiations with Japan and other countries under the General Agreement on Tariffs and Trade. The quota is based on 20 percent of the previous year's United States pack of canned tuna.

The notice was published in the April 2, 1960, Federal Register.

White House

PRESIDENT APPROVES NORTH PACIFIC HALIBUT REGULATIONS FOR 1960:

The regulations of the International Pacific Halibut Commission adopted pursuant to the Pacific Halibut Fishery Convention between the United States and Canada (signed March 2, 1953) were approved by the President of the United States on March 24, 1960. The regulations were published in the Federal Register of April 6, 1960.

Note: Also see Commercial Fisheries Review, April 1960 p. 33.

Eighty-Sixth Congress

(Second Session)

Public bills and resolutions which may directly or indirectly affect the fisheries and allied industries are reported upon. Introduction, referral to committees, pertinent legislative actions, hearings, and other chamber actions by the House and Senate, as well as signature into law or other final disposition are covered.

CHEMICAL PESTICIDES COORDINATION ACT: H. R. 11502 (Wolf), introduced in House on March 31, a bill to provide for advance consultation with Fish and Wildlife Service and with State wildlife agencies before the beginning of any Federal program involving the use of pesticides or other chemicals designed for mass biological controls; to the Committee on Merchant Marine and Fisheries.

COLOR ADDITIVES IN FOOD: The House Committee on Interstate and Foreign Commerce on March 11, 1960, heard testimony of representatives of the Department of Agriculture on H. R. 7624 and S. 2197, color additives bills. The Committee adjourned subject to call of the Chair.

FISH AND WILDLIFE LEGISLATION: The Subcommittee on Fish and Wildlife of the House Committee on Merchant Marine and Fisheries held hearings March 22-23, 1960, and heard testimony from various public witnesses on S. 1262, to establish a research program in order to determine means of improving the conservation of game and fish in dam reservoirs; and on H. R. 8613 and S. 2481, pertaining to fishing vessel mortgage insurance, the subcommittee heard testimony from the Director of the U. S. Bureau of Commercial Fisheries; also took up H. R. 7386 and S. 2053, re acceptance by U. S. of a fish hatchery in South Carolina.

The subcommittee, in executive session, reported to the full committee S. 2053, to provide for acceptance by the U. S. of a fish hatchery in the State of South Carolina; and also S. 1262 and S. 2481.

FISHERMEN'S BENEFITS: House on March 30 took up Executive Communication 2001, a letter from Assistant Secretary of State, transmitting texts of several International Labor Organization Conventions, which included the Convention (No. 112) concerning the minimum age for admission as fishermen and ILO Convention (No. 113) concerning medical examination of fishermen. These were adopted by the International Labor Conference at its 43rd session, at Geneva, June 19, 1959, pursuant to Article 19 of the Constitution of ILO (H. Doc. No. 365); referred to the Committee on Foreign Affairs.

GAME FISH CONSERVATION IN DAM RESERVOIRS: H. R. 11298 (Johnson of Calif.), introduced in House March 21, 1960, a bill to direct the Secretary of the Interior to establish a research pro-

gram in order to determine means of improving the conservation of game fish in dam reservoirs; to the Committee on Merchant Marine and Fisheries.

HYDROFOIL VESSEL: S. 3206 (Magnuson), a bill to authorize the construction of an oceangoing hydrofoil vessel in order to demonstrate the commercial application of hydrofoil seacraft; to the Committee on Interstate and Foreign Commerce; intorduced in Senate March 15, 1960. Identical to S. 3126 (Bartlett), introduced in Senate March 1, 1960.

INTERIOR DEPARTMENT APPROPRIATIONS: On March 29, 1960, by unanimous vote of 78 yeas the Senate passed with amendments H. R. 10401, fiscal 1961 appropriations for the Department of the Interior, and related agencies, after adopting all committee amendments en bloc, which were thereafter considered as original text for purpose of further amendment. Senate insisted on its amendments, asked for conference, and appointed conferees.

Senate Report No. 1203, Interior Department and Related Agencies Appropriation Bill, 1961 (March 25, 1960, 86th Congress, Second Session, Report from the Committee on Appropriations to accompany H. R. 10401), 42 pp. printed. Contains appropriations for the Department of the Interior and related agencies for fiscal year 1960. Included are funds for the Fish and Wildlife Service and its two Bureaus totaling $37,035,000, as recommended by the Committee. Office of the Commissioner $342,000.

Bureau of Commercial Fisheries $7,051,000 for the management and investigations of resources, with the following increases (total $802,000) recommended by the Committee--exploratory fishing and gear development $160,000 for the continuation of the south Atlantic exploratory program (from Cape Hatteras to Cape Canaveral) which was established in August 1959 with funds allocated from the Saltonstall-Kennedy program; pesticides research $67,000; industrial fisheries research (menhaden, sardines, and herring) $175,000; and tuna fisheries investigations $400,000. For construction $2,400,000--$2,055,000 for the construction of a fishing research vessel to replace the recently decommissioned Albatross III; for Great Lakes $85,000; design biological laboratory, Seattle, Wash., $45,000; quarters construction, Brooks Lake, Alaska, $35,000; dock repair and improvement, Woods Hole, Mass., $60,000; station rehabilitation, Little Port Walter, Alaska, $45,000; laboratory rehabilitation, Galveston, Tex., $30,000; utility system improvement, Boothbay Harbor, Maine, $20,000; bulkhead construction, Beaufort, N. C., $25,000. For Fisheries Loan Fund $250,000 for administering the program. General Administrative Expenses $361,000. Administration of Pribilof Islands $2,070,000, includes $304,500 for the construction of new facilities on the islands and an additional $18,500 for increased operating costs. These funds are derived from the receipts from the sale of fur skins and other products from the Islands.

Bureau of Sport Fisheries and Wildlife for the management and investigation of resources, with increases recommended as follows--$25,000 for fishery management program to assist the tribes of Navajo, Hopi, Fort Apache, and Zuni Reservations in development of fisheries; $10,000 for initiation of fish-farming research program; $345,000 (includes $250,000 for pesticide-wildlife relationships) for wildlife research; $250,000 to initiate a program of marine sport fisheries research authorized by Marine Sport Fisheries Act in 1959. The budget estimate includes $3,564,750 for activities that have previously been financed from funds made available from "Migratory Bird Conservation Account" (Duck Stamp Funds). For construction $4,841,000--principally for hatchery facilities. General Administrative Expenses $950,000, and includes $311,800 for activities previously financed with funds from the "Migratory Bird Conservation Account."

Interior Department and Related Agencies Appropriations for 1961 (Hearings before a subcom- H. R. 10401, a bill making appropriations for the Department of the Interior and related agencies for the fiscal year ending June 30, 1961, and for other purposes), 1,110 pp., printed. Contains text of testimony presented by Government representatives; certain Departmental and Commission reports; various statements, letters, and information submitted; and Committee recommendations.

MINIMUM WAGE INCREASE: H. R. 11229 (Buckley), a bill to amend the Fair Labor Standards Act of 1938 so as to increase from $1 to $1.25 the minimum hourly wage prescribed by section 6(a)(1) of that Act; to the Committee on Education and Labor; introduced in House March 17, 1960. Identical to H. R. 11080 (Gilbert), introduced March 11, 1960 and similar in purpose to H. R. 11431 (Gallagher), introduced in House March 29, 1960, and several other bills introduced during first and second sessions of the 86th Congress.

SALTONSTALL-KENNEDY ACT FUNDS REAPPORTIONMENT: H. R. 10939 (Rivers of Alaska), a bill to amend the Act of August 11, 1939, to provide that a percentage of the funds available under the Act shall be apportioned among the states and paid to certain state agencies for projects pertaining to commercial fisheries; to the Committee on Merchant Marine and Fisheries; introduced in House on March 7, 1960. Provides for reapportionment of a separate fund created for use of the Secretary of Interior. The following apportionment schedule would apply: (1) Forty-two percent of the funds shall be expended by the Secretary as provided in section 2(a) of the Saltonstall-Kennedy Act of 1954 (P. L. 466). (2) Fifty percent of the funds shall be apportioned by the Secretary among the States which manage a commercial fishery on a percentage basis determined by the ratio of the value of commercial raw fish landed within each State (regardless of where caught) plus the value of capital investments in all fishing industry property located within each State to the total value of all commercial raw fish landed in all participating States plus the total value of capital investments in all fishing industry property located within all participating States; funds so apportioned shall be made available to the State agencies with authority to regulate commercial fisheries, to be spent on any biological, technological, or other research projects pertaining to the commercial fisheries of such participating States which are approved by the Secretary and to develop locally unexploited fish products as set forth in section 2(a) of the Act. (3) Eight percent of the funds shall be available to pay administrative costs of the Secretary in carrying out his prescribed duties.

SEAWEEDS (GROUND, POWDERED, OR GRANULATED) ON FREE IMPORT LIST: The Senate on March 28 passed H. R. 5884, a bill to place ground, powdered, or granulated seaweeds on the free duty list. This would put all ground, granulated, or powdered seaweeds on the free list. At the present time crude or unmanufactured seaweeds are free of duty. Kelp, a form of seaweed, is free of duty also when ground, granulated, or powdered. H. R. 5884 would put all ground, granulated, or powdered seaweed in the same category as kelp. At the present time the duty is 5 percent. The uses are much the same, namely as a jelling, thickening agent in certain prepared foods and extracts, and is considered a raw material in those uses. Seaweeds manufactured beyond grinding would not be affected by the bill.

SECOND SUPPLEMENTAL APPROPRIATIONS: On March 24, 1960, the Senate passed H. R. 10743 (Thomas), second supplemental appropriations for fiscal year 1960. Includes for Fish and Wildlife Service, Bureau of Commercial Fisheries, an increase of $55,000 to modify and improve docking facilities at Technological Laboratory, Pascagoula, Miss.

SHRIMP IMPORT DUTIES: H. R. 10961 (Herlong), a bill to amend the Tariff Act of 1930 to provide for the establishment of country-by-country quotas for the importation of shrimp and shrimp products, to impose a duty on all shrimp imported in excess of the applicable quota; to the Committee on Ways and Means; introduced in House on March 8, 1960. Similar in purpose to about 29 bills introduced during the first and second sessions of the 86th Congress. H. R. 10961 omits part of the language of H. R. 8769 (Herlong) which was introduced on August 24, 1959, during the first session of the 86th Congress. Similar to S. 3204 (Ellender et al), introduced in Senate March 15, 1960, a bill to amend the Tariff Act of 1930 to provide for the establishment of country-by-country quotas for the importation of shrimp and shrimp products, to impose a duty on all unprocessed shrimp imported in excess of the applicable quota, and to impose a duty on processed shrimp and prohibit its importation in excess of the applicable quota; to the Committee on Finance.

On March 18, the names of Senators Talmadge, Holland, Magnuson, Kerr, Gruening, and Bartlett were added as additional cosponsors of S. 3204, introduced by Ellender (for himself, Long of Louisiana, Eastland, Stennis, and Yarborough) on March 15, 1960.

S. 3204 directs establishment of initial quotas for processed and unprocessed shrimp, effective for year 1960. The initial quota by country cannot be less than the actual 1958 imports, or January-August 1959 imports, plus 50 percent, whichever is higher. A country with no history of importation would have a provisional quota of 100,000 pounds of shrimp. After the initial quota is established, the bill provides for a cumulative increase in country-by-country quotas for 5 years in order to determine the permanent quotas for each country. These annual quota increases range from 5 percent annually, compounded, for countries exporting more than 5 million pounds of shrimp to this country to 25 percent for those exporting less than 1 million pounds. At the end of the 5 years, a permanent basic quota for each country will be calculated under this formula: First, the average annual importations for the years 1960 to 1964, inclusive, not counting any year in which there were no imports; second, a minimum guaranteed permanent basic quota not less than the actual importation for 1964. Imports of unprocessed shrimp in excess of quota will be subject to 50 percent ad valorem duty. All processed shrimp will pay a 25-percent ad valorem duty within quotas. Virtually all shrimp importations fall within the classification of "unprocessed" as defined in this bill.

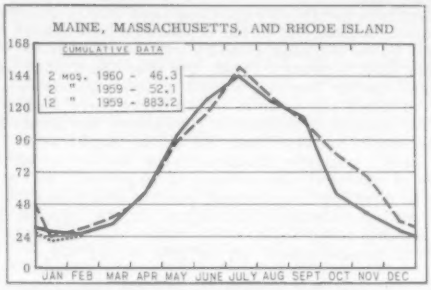
South Carolina Memorial: To the House and the Senate on March 28 was presented a memorial of the Legislature of the State of South Carolina, memorializing the President and the Congress of the United States to enact suitable legislation to prohibit importedsrhimp from competing with our shrimping industry and to favorably consider H. R. 8982; referred to the Committee on Ways and Means.

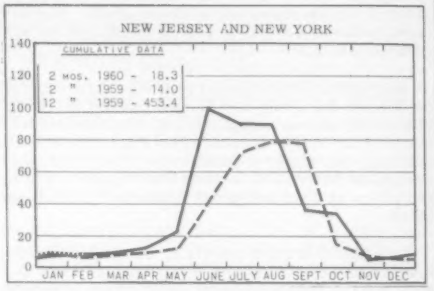
STAMP FOR SPORT FISHING: H. R. 11410 (George P. Miller), introduced in the House on March 28, a bill to provide for the issuance of a Federal fishing stamp, to give the consent of Congress to a compact relating to the use of a Federal-State fishing stamp in connection with noncommercial fishing licenses for nonresidents of States, and for other purposes; to the Committee on Merchant Marine and Fisheries.

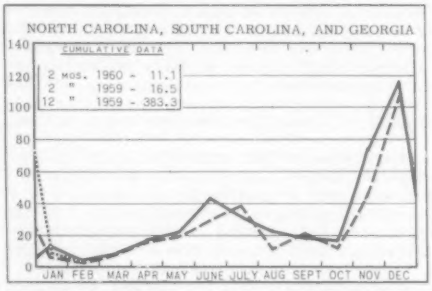
TARIFF NEGOTIATIONS: H. Con. Res. 618 (Cunningham), concurrent resolution expressing the sense of Congress that the United States should not grant further tariff reductions in the forthcoming tariff negotiations under the provisions of the Trade Agreements Extension Act of 1958, and for other purposes; to the Committee on Ways and Means; introduced in House March 11, 1960. Identical to several concurrent resolutions previously introduced.

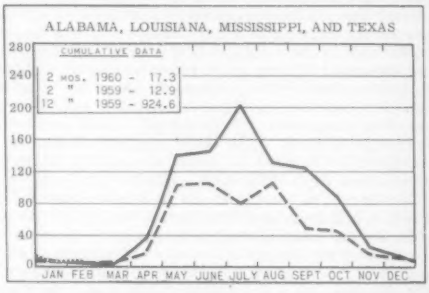
CHART 1 - FISHERY LANDINGS for SELECTED STATES

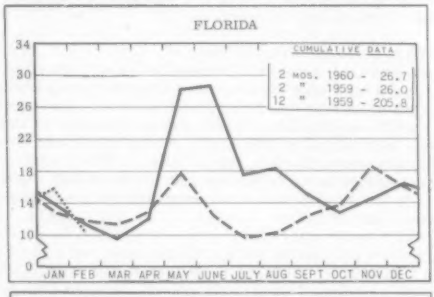
In Millions of Pounds

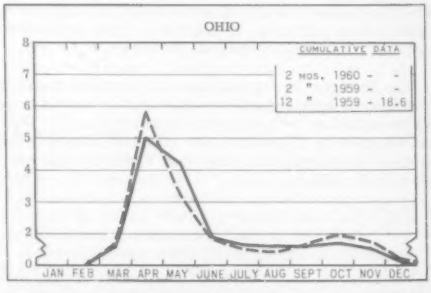


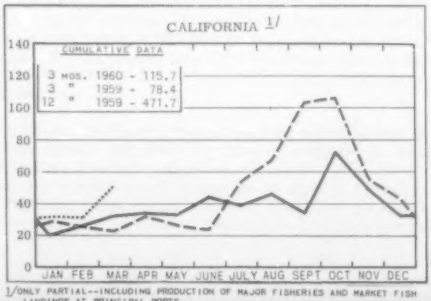


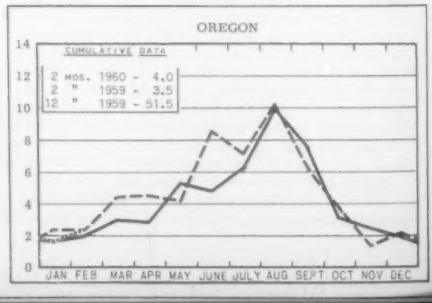








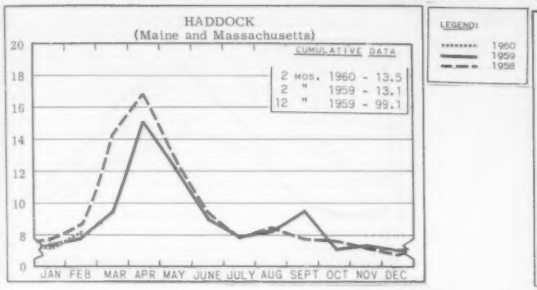


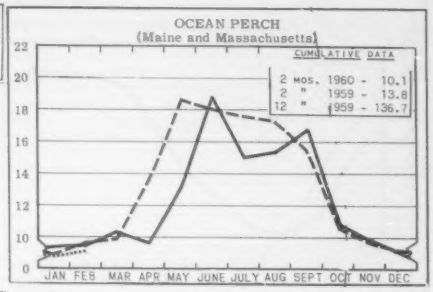


1/ONLY PARTIAL--INCLUDING PRODUCTION OF MAJOR FISHERIES AND MARKET FISH LANDINGS AT PRINCIPAL PORTS.

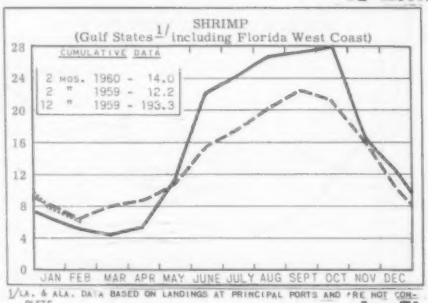
CHART 2 - LANDINGS for SELECTED FISHERIES

In Millions of Pounds

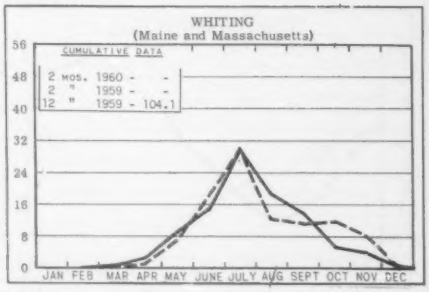

HADDOCK
(Maine and Massachusetts)
CUMULATIVE DATA
2 MOS. 1960 - 13.5
2 " 1959 - 13.1
12 " 1959 - 99.1
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC


OCEAN PERCH
(Maine and Massachusetts)
CUMULATIVE DATA
2 MOS. 1960 - 10.1
2 " 1959 - 13.8
12 " 1959 - 136.7
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC

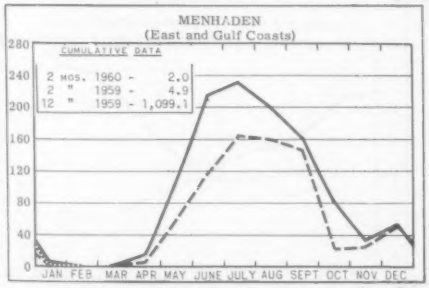
In Millions of Pounds

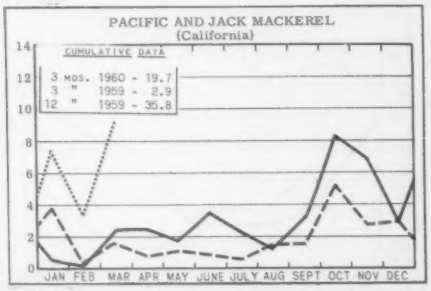

SHRIMP
(Gulf States 1/ including Florida West Coast)
CUMULATIVE DATA
2 MOS. 1960 - 14.0
2 " 1959 - 12.2
12 " 1959 - 193.3
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC

1/LA. & ALA. DATA BASED ON LANDINGS AT PRINCIPAL PORTS AND ARE NOT COMPLETE.

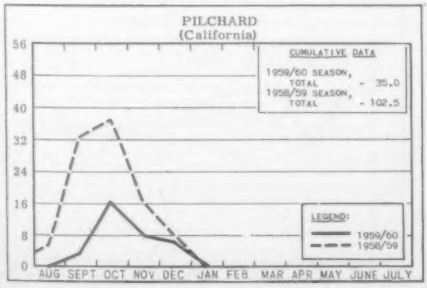

WHITING
(Maine and Massachusetts)
CUMULATIVE DATA
2 MOS. 1960 -
2 " 1959 -
12 " 1959 - 104.1
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC

In Thousands of Tons


MENHADEN
(East and Gulf Coasts)
CUMULATIVE DATA
2 MOS. 1960 - 2.0
2 " 1959 - 4.9
12 " 1959 - 1,099.1
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC


PACIFIC AND JACK MACKEREL
(California)
CUMULATIVE DATA
3 MOS. 1960 - 19.7
3 " 1959 - 2.9
12 " 1959 - 35.8
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC

In Thousands of Tons



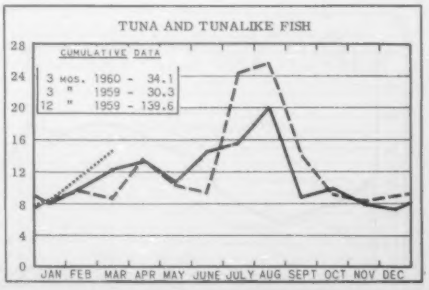
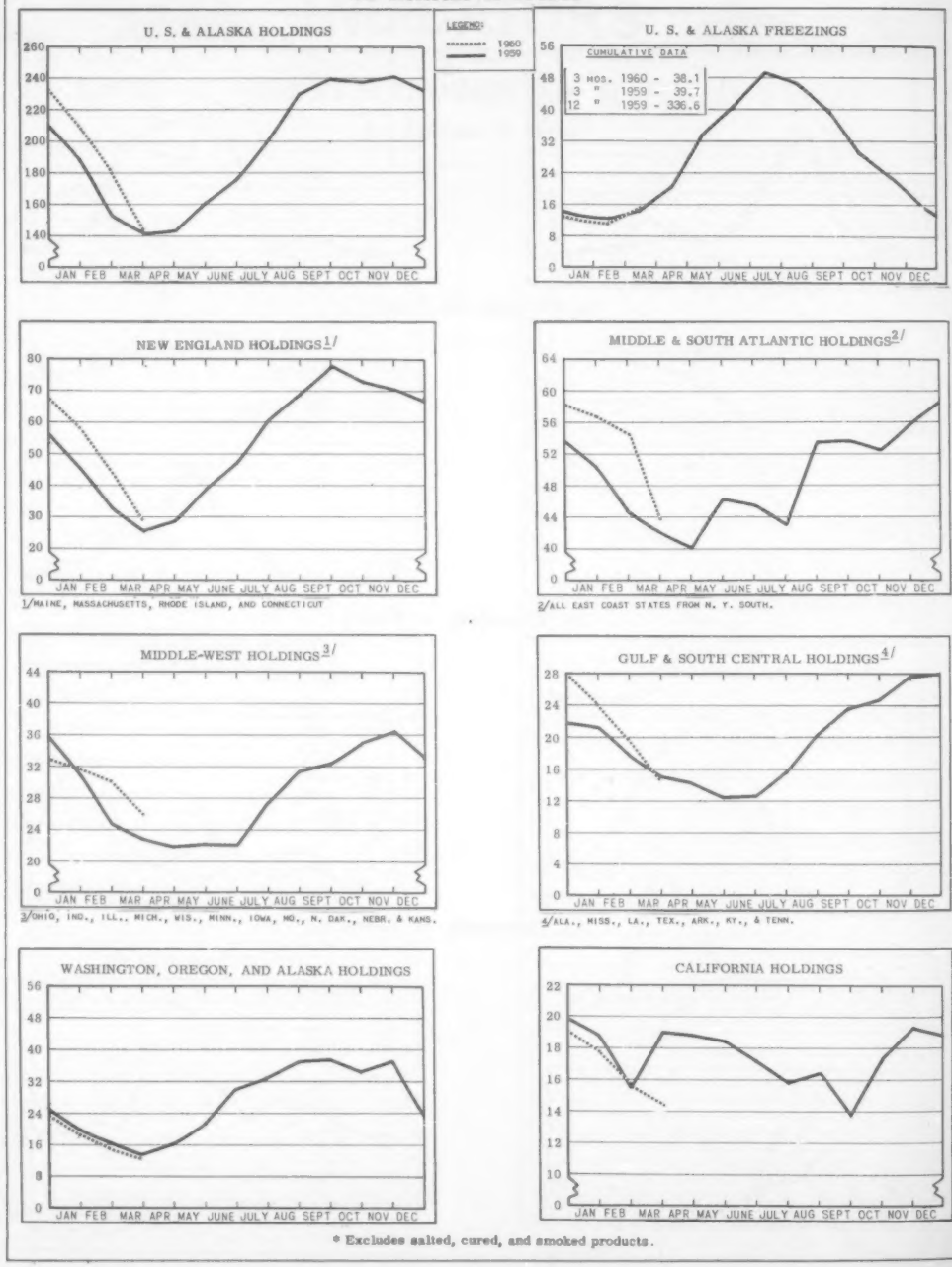

TUNA AND TUNALIKE FISH
CUMULATIVE DATA
3 MOS. 1960 - 34.1
3 " 1959 - 30.3
12 " 1959 - 139.6
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC

CHART 3 - COLD-STORAGE HOLDINGS and FREEZINGS of FISHERY PRODUCTS *

In Millions of Pounds


U. S. & ALASKA HOLDINGS
LEGEND:
1960
1959
U. S. & ALASKA FREEZINGS
CUMULATIVE DATA
3 MOS. 1960 - 38.1
3 " 1959 - 39.7
12 " 1959 - 336.6
NEW ENGLAND HOLDINGS 1/
MIDDLE & SOUTH ATLANTIC HOLDINGS 2/
MIDDLE-WEST HOLDINGS 3/
GULF & SOUTH CENTRAL HOLDINGS 4/
WASHINGTON, OREGON, AND ALASKA HOLDINGS
CALIFORNIA HOLDINGS
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC

1/MAINE, MASSACHUSETTS, RHODE ISLAND, AND CONNECTICUT

2/ALL EAST COAST STATES FROM N. Y. SOUTH.

3/OHIO, IND., ILL., MICH., WIS., MINN., IOWA, MO., N. DAK., NEBR. & KANS.

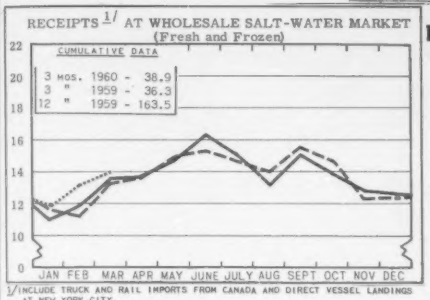
4/ALA., MISS., LA., TEX., ARK., KY., & TENN.

* Excludes salted, cured, and smoked products.

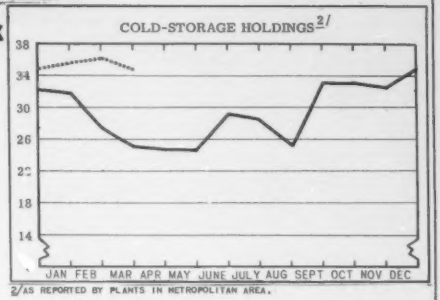
CHART 4 - RECEIPTS and COLD-STORAGE HOLDINGS of FISHERY PRODUCTS at PRINCIPAL DISTRIBUTION CENTERS

In Millions of Pounds

NEW YORK CITY

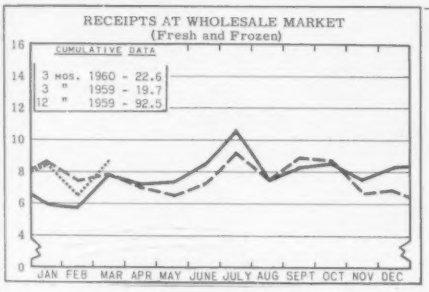

RECEIPTS 1/ AT WHOLESALE SALT-WATER MARKET
(Fresh and Frozen)
CUMULATIVE DATA
3 MOS. 1960 - 38.9
3 " 1959 - 36.3
12 " 1959 - 163.5
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC

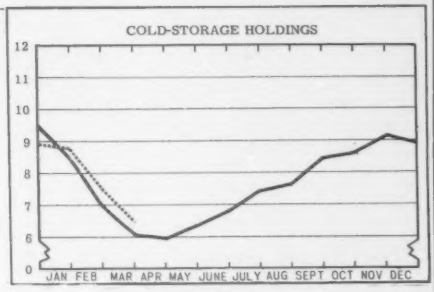
1/INCLUDE TRUCK AND RAIL IMPORTS FROM CANADA AND DIRECT VESSEL LANDINGS AT NEW YORK CITY.



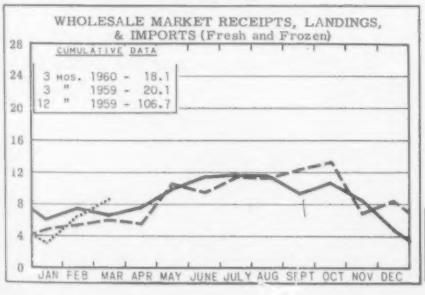
2/AS REPORTED BY PLANTS IN METROPOLITAN AREA.

CHICAGO


RECEIPTS AT WHOLESALE MARKET
(Fresh and Frozen)
CUMULATIVE DATA
3 MOS. 1960 - 22.6
3 " 1959 - 19.7
12 " 1959 - 92.5
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC



SEATTLE


WHOLESALE MARKET RECEIPTS, LANDINGS,
& IMPORTS (Fresh and Frozen)
CUMULATIVE DATA
3 MOS. 1960 - 18.1
3 " 1959 - 20.1
12 " 1959 - 106.7
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC

LEGEND:
1960
1959
1958

BOSTON

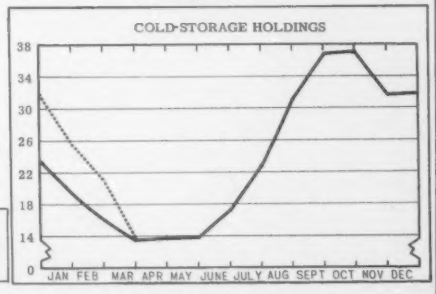
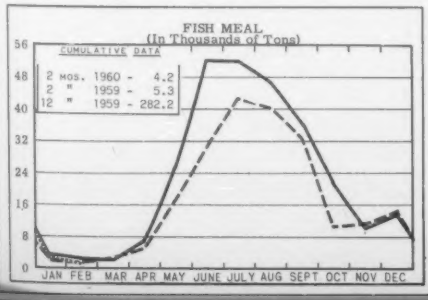


CHART 5 - FISH MEAL and OIL PRODUCTION - U.S and ALASKA


FISH MEAL
(In Thousands of Tons)
CUMULATIVE DATA
2 MOS. 1960 - 4.2
2 " 1959 - 5.3
12 " 1959 - 282.2
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC

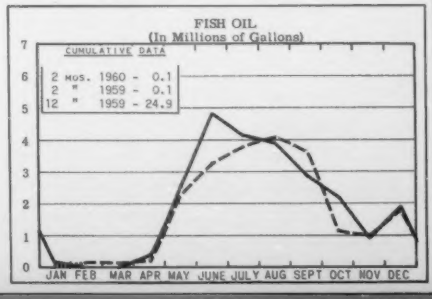
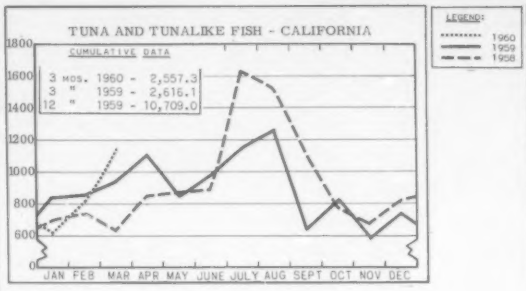
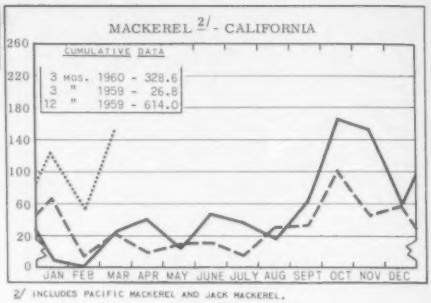

FISH OIL
(In Millions of Gallons)
CUMULATIVE DATA
2 MOS. 1960 - 0.1
2 " 1959 - 0.1
12 " 1959 - 24.9
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC

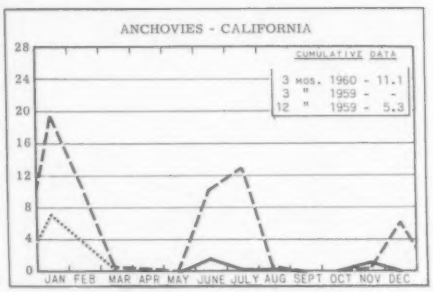
CHART 6 - CANNED PACKS of SELECTED FISHERY PRODUCTS

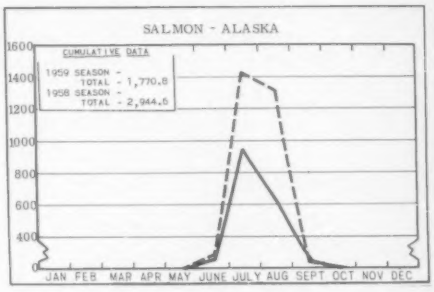
In Thousands of Standard Cases

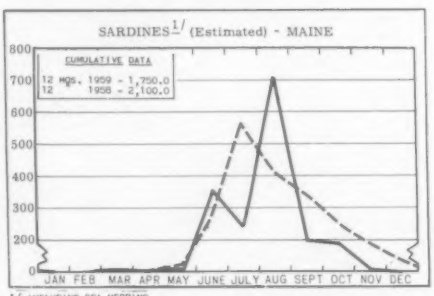

TUNA AND TUNALIKE FISH - CALIFORNIA
CUMULATIVE DATA
3 MOS. 1960 - 2,557.3
3 " 1959 - 2,616.1
12 " 1959 - 10,709.0
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC


MACKEREL 2/ - CALIFORNIA
CUMULATIVE DATA
3 MOS. 1960 - 328.6
3 " 1959 - 26.8
12 " 1959 - 614.0
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC

2/ INCLUDES PACIFIC MACKEREL AND JACK MACKEREL.



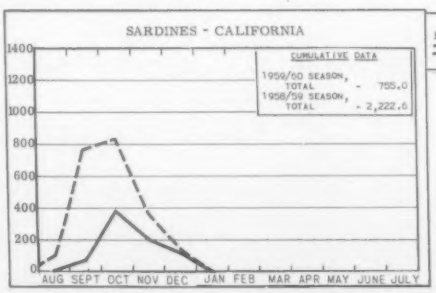

SALMON - ALASKA
CUMULATIVE DATA
1959 SEASON - TOTAL - 1,770.8
1958 SEASON - TOTAL - 2,944.6
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC


SARDINES 1/ (Estimated) - MAINE
CUMULATIVE DATA
12 MOS. 1959 - 1,750.0
12 " 1958 - 2,100.0
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC

1/ INCLUDING SEA HERRING.

STANDARD CASES

Variety	No. Cans	Designation	Net Wgt.
SARDINES.....	100	¼ drawn	3¾ oz.
SHRIMP.....	48	--	5 oz.
TUNA.....	48	# ½ tuna	6 & 7 oz.
PILCHARDS...	48	# 1 oval	15 oz.
SALMON.....	48	1-lb. tall	16 oz.
ANCHOVIES...	48	½-lb.	8 oz.


SARDINES - CALIFORNIA
CUMULATIVE DATA
1959/60 SEASON, TOTAL - 755.0
1958/59 SEASON, TOTAL - 2,222.6
AUG SEPT OCT NOV DEC JAN FEB MAR APR MAY JUNE JULY

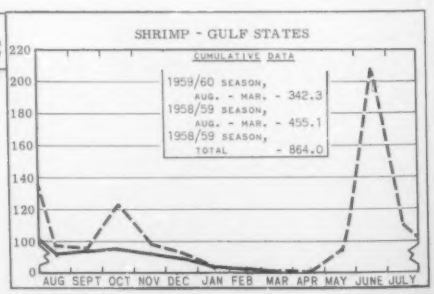
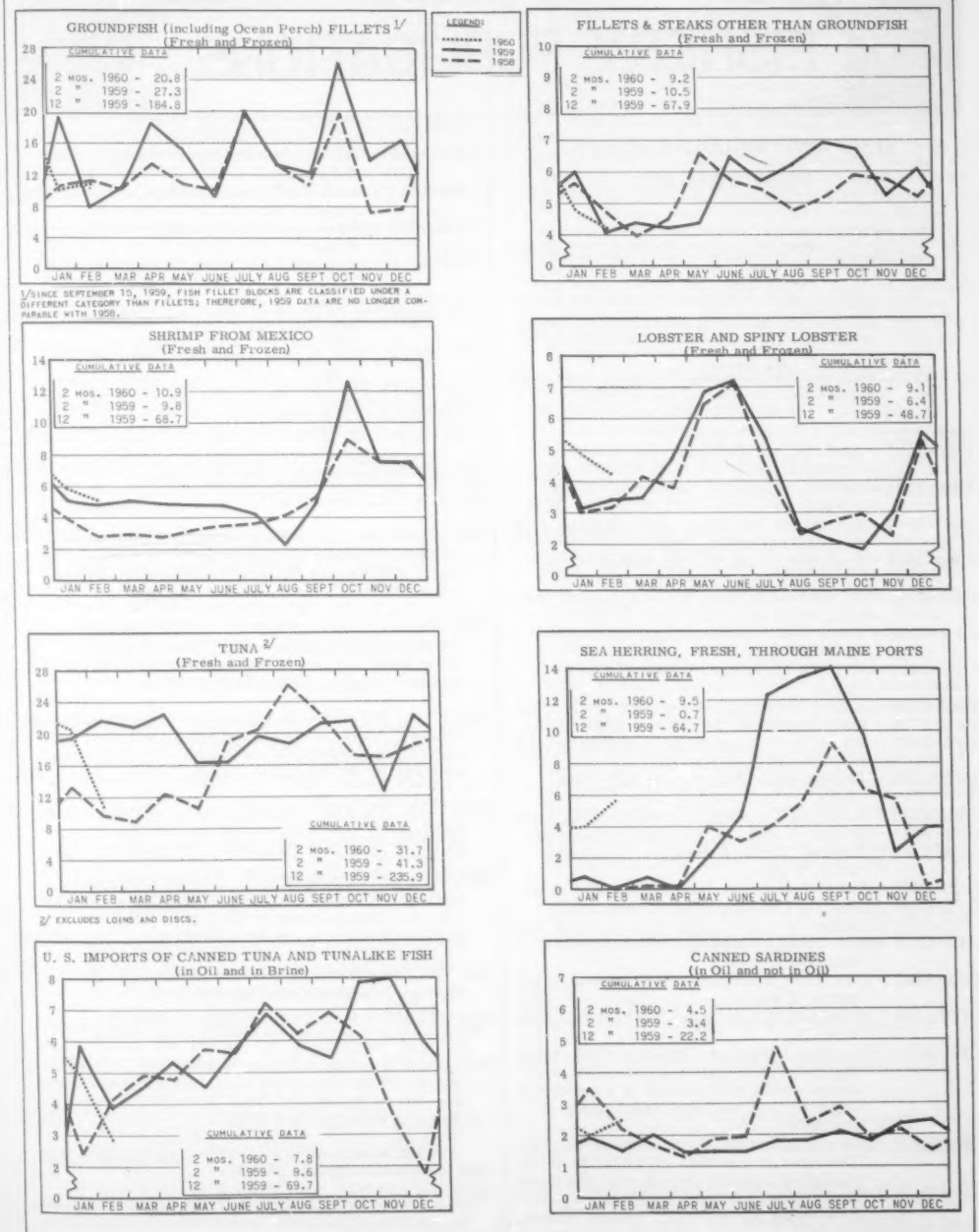

SHRIMP - GULF STATES
CUMULATIVE DATA
1959/60 SEASON, AUG. - MAR. - 342.3
1958/59 SEASON, AUG. - MAR. - 455.1
1958/59 SEASON, TOTAL - 864.0
AUG SEPT OCT NOV DEC JAN FEB MAR APR MAY JUNE JULY

CHART 7 - U.S. FISHERY PRODUCTS IMPORTS

In Millions of Pounds


GROUNDFISH (including Ocean Perch) FILLETS 1/
(Fresh and Frozen)
CUMULATIVE DATA
2 MOS. 1960 - 20.8
2 " 1959 - 27.3
12 " 1959 - 184.8
LEGEND:
1960
1959
1958
FILLETS & STEAKS OTHER THAN GROUNDFISH
(Fresh and Frozen)
CUMULATIVE DATA
2 MOS. 1960 - 9.2
2 " 1959 - 10.5
12 " 1959 - 67.9
1/SINCE SEPTEMBER 15, 1959, FISH FILLET BLOCKS ARE CLASSIFIED UNDER A DIFFERENT CATEGORY THAN FILLETS; THEREFORE, 1959 DATA ARE NO LONGER COMPARABLE WITH 1958.
SHRIMP FROM MEXICO
(Fresh and Frozen)
CUMULATIVE DATA
2 MOS. 1960 - 10.9
2 " 1959 - 9.8
12 " 1959 - 68.7
LOBSTER AND SPINY LOBSTER
(Fresh and Frozen)
CUMULATIVE DATA
2 MOS. 1960 - 9.1
2 " 1959 - 6.4
12 " 1959 - 48.7
TUNA 2/
(Fresh and Frozen)
CUMULATIVE DATA
2 MOS. 1960 - 31.7
2 " 1959 - 41.3
12 " 1959 - 235.9
SEA HERRING, FRESH, THROUGH MAINE PORTS
CUMULATIVE DATA
2 MOS. 1960 - 9.5
2 " 1959 - 0.7
12 " 1959 - 64.7
2/ EXCLUDES LOINS AND DISCS.
U. S. IMPORTS OF CANNED TUNA AND TUNALIKE FISH
(in Oil and in Brine)
CUMULATIVE DATA
2 MOS. 1960 - 7.8
2 " 1959 - 9.6
12 " 1959 - 69.7
CANNED SARDINES
(in Oil and not in Oil)
CUMULATIVE DATA
2 MOS. 1960 - 4.5
2 " 1959 - 3.4
12 " 1959 - 22.2
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC

FISH AND WILDLIFE SERVICE PUBLICATIONS

THE PROCESSED PUBLICATIONS ARE AVAILABLE FREE FROM THE DIVISION OF INFORMATION, U. S. FISH AND WILDLIFE SERVICE, WASHINGTON 25, D. C. TYPES OF PUBLICATIONS ARE DESIGNATED AS FOLLOWS:

CFS - CURRENT FISHERY STATISTICS OF THE UNITED STATES AND ALASKA.
SL - BRANCH OF STATISTICS LISTS OF DEALERS IN AND PRODUCERS OF FISHERY PRODUCTS AND BYPRODUCTS.
SSR.- FISH. SPECIAL SCIENTIFIC REPORTS--FISHERIES (LIMITED DISTRIBUTION).
SEP.- SEPARATES (REPRINTS) FROM COMMERCIAL FISHERIES REVIEW.

Number Title

CFS-2191 - Massachusetts Landings, October 1959, 5 pp..
CFS-2194 - Shrimp Landings, September 1959, 6 pp.
CFS-2195 - Louisiana Landings, July, August, and September 1959, 4 pp.
CFS-2212 - Fish Meal and Oil, December 1959, 2 pp.
CFS-2220 - Frozen Fish Report, 1959 Annual Summary, 14 pp.
CFS-2222 - South Carolina Landings, December 1959, 2 pp.
CFS-2223 - Florida Landings, December 1959, 6 pp.
CFS-2225 - Maine Landings, December 1959, 3 pp.
CFS-2226 - Ohio Landings, December 1959, 2 pp.
CFS-2227 - Rhode Island Landings, December 1959, 3 pp.
CFS-2228 - Frozen Fish Report, January 1960, 8 pp.
CFS-2229 - Alabama Landings, October 1959, 2 pp.
CFS-2232 - Shrimp Landings, October 1959, 6 pp.
CFS-2234 - Massachusetts Landings, November 1959, 5 pp.
CFS-2235 - Texas Landings, December 1959, 3 pp.
CFS-2236 - Georgia Landings, December 1959, 2 pp.
CFS-2237 - New Jersey Landings, 1959 Annual Summary, 6 pp.
CFS-2238 - New York Landings, 1959 Annual Summary, 8 pp.
CFS-2239 - Mississippi Landings, November 1959, 2 pp.
CFS-2241 - Virginia Landings, January 1960, 2 pp. The first in a series of monthly bulletins which will contain the catch and value of fish and shellfish landed in Virginia.
CFS-2242 - Maryland Landings, January 1960, 2 pp. The first in a series of bulletins to be published monthly which will show the total Maryland catch and landed values by species for the major water areas.
CFS-2244 - California Landings, October 1959, 4 pp.
CFS-2249 - South Carolina Landings, January 1960, 2 pp.
CFS-2252 - North Carolina Landings, January 1960, 3 pp.
CFS-2254 - Alabama Landings, November 1959, 2 pp.
CFS-2255 - Shrimp Landings, November 1959, 6 pp.
CFS-2261 - Alabama Landings, December 1959, 2 pp.
CFS-2262 - New Jersey Landings, January 1960, 3 pp.
CFS-2264 - Florida Landings, January 1960, 6 pp.
CFS-2265 - Maine Landings, January 1960, 3 pp.
CFS-2266 - Georgia Landings, January 1960, 2 pp.

Wholesale Dealers in Fishery Products (Revised):
SL-20 - Texas (Coastal Area), 1959.
SL-21 - California, 1959.

SSR-Fish. No. 290 - Water Quality Study of Wenatchee and Middle Columbia Rivers Before Dam Construction, by Robert O. Sylvester, 125 pp., illus., March 1959.

SSR-Fish. No. 314 - Sources of Hydrographic and Meteorological Data on the Great Lakes, by Charles F. Powers, David L. Jones, and John C. Ayers, 187 pp., illus., July 1959.

SSR-Fish. No. 315 - Northeastern Pacific Albacore Survey. Part 2--Oceanographic and Meteorological Observations, by Richard J. Callaway and James W. McGary, 138 pp., illus., July 1959.

SSR-Fish. No. 318 - Oceanographic Observations, 1958, East Coast of the United States, by C. Godfrey Day, 126 pp., illus., November 1959.

Sep. No. 583 - Processing and Quality Studies of Shrimp Held in Refrigerated Sea Water and Ice: Part 2 - Comparison of Objective Methods for Quality Evaluation of Raw Shrimp.

Sep. No. 584 - Shrimp - Waste Meal: Effect of Storage Variables on Pigment Content.

Sep. No. 585 - New Technological Laboratory for Fisheries Research in Gloucester, Mass.

Sep. No. 586 - Research in Service Laboratories (April 1960): Contains these articles--"Composition of Rockfish," and "Irradiation Preservation of Pacific Cod Fillets."

THE FOLLOWING SERVICE PUBLICATIONS ARE AVAILABLE ONLY FROM THE SPECIFIC OFFICE MENTIONED.

"The Acoustical Behavior of Some Fishes in the Bimini Area," by James M. Moulton, The Biological

Bulletin, vol. 114, no. 3, 1958, pp. 357-374, printed. (U. S. Fish and Wildlife Service, The Marine Biological Laboratory, Woods Hole, Mass.)

"The Role of the Blood in the Transportation of Strontium ^{90}-Yttrium^{90} in Teleost Fish," by Howard Boroughs and Della F. Reid, article, The Biological Bulletin, vol. 115, no. 1, 1958, pp. 64-73, printed. (U. S. Fish and Wildlife Service, The Marine Biological Laboratory, Woods Hole, Mass.)

(Baltimore) Monthly Summary - Fishery Products, November and December 1959; 9 and 10 pp. each. (Market News Service, U. S. Fish and Wildlife Service, 400 E. Lombard St., Baltimore 2, Md.) Receipts at Baltimore by species and by states and provinces for fresh- and salt-water fish and shellfish; total receipts by species and comparisons with previous years; and wholesale prices on the Baltimore market; for the months indicated.

California Fishery Products Monthly Summary, January 1960, 13 pp. (Market News Service, U. S. Fish and Wildlife Service, Post Office Bldg., San Pedro, Calif.) California cannery receipts of tuna and tunalike fish, mackerel, anchovies; and pack of canned tuna, mackerel, and anchovies. Market fish receipts at San Pedro, Santa Monica, and Eureka areas; California imports; canned fish and frozen shrimp prices; ex-vessel prices for cannery fish; American Tuna Boat Association auction sales; for the month indicated.

(Chicago) Monthly Summary of Chicago's Fresh and Frozen Fishery Products Receipts and Wholesale Market Prices, January 1960, 12 pp. (Market News Service, U. S. Fish and Wildlife Service, 565 W. Washington St., Chicago 6, Ill.) Receipts at Chicago by species and by states and provinces for fresh- and salt-water fish and shellfish; and wholesale prices for fresh and frozen fishery products; for the month indicated.

Gulf Monthly Landings, Production, and Shipments of Fishery Products, February 1960, 8 pp. (Market News Service, U. S. Fish and Wildlife Service, 609-611 Federal Bldg., New Orleans 12, La.) Gulf States shrimp, oyster, finfish, and blue crab landings; crab meat production; LCL express shipments from New Orleans; wholesale prices of fish and shellfish on the New Orleans French Market; sponge sales; and imports at Port Isabel and Brownsville, Tex.; for the month indicated.

Halibut and Troll Salmon Landings and Ex-Vessel Prices for Seattle, Alaska Ports, and British Columbia, 1958-1959, 34 pp. (Market News Service, U. S. Fish and Wildlife Service, Pier 42 So., Seattle 4, Wash.) Lists the landings of halibut and troll salmon at leading United States ports of the Pacific Coast, and halibut landings at leading British Columbia ports for 1959, with comparative data.

Monthly Summary of Fishery Products Production in Selected Areas of Virginia, North Carolina, and Maryland, February 1960, 4 pp. (Market News Service, U. S. Fish and Wildlife Service, 18 So. King St., Hampton, Va.) Fishery landings and production for the Virginia areas of Hampton Roads, Lower Northern Neck, and Eastern Shore; the Maryland areas of Crisfield, Cambridge, and Ocean City; and the North Carolina areas of Atlantic, Beaufort, and Morehead City; together with cumulative and comparative data; for the month indicated.

New England Fisheries--Monthly Summary, January and February 1960, 22 pp. each. (Market News Service, U. S. Fish and Wildlife Service, 10 Commonwealth Pier, Boston 10, Mass.) Reviews the principal New England fishery ports, and presents food fish landings by ports and species; industrial fish landings and ex-vessel prices; imports; cold-storage stocks of fishery products in New England warehouses; fishery landings and ex-vessel prices for ports in Massachusetts (Boston, Gloucester, New Bedford, Provincetown, and Woods Hole), Maine (Portland and Rockland), Rhode Island (Point Judith), and Connecticut (Stonington); frozen fishery products prices to primary wholesalers at Boston, Gloucester, and New Bedford; and landings and ex-vessel prices for fares landed at the Boston Fish Pier and sold through the New England Fish Exchange; for the months indicated.

New York City's Wholesale Fishery Trade--Monthly Summary for December 1960, 21 pp. (Market News Service, 155 John St., New York 38, N. Y.) Includes summaries and analyses of receipts and prices on wholesale Fulton Fish Market, imports entered at New York City, primary wholesaler prices for frozen products, and marketing trends; for the month indicated.

(Seattle) Washington, Oregon, and Alaska Receipts and Landings of Fishery Products for Selected Areas and Fisheries, Monthly Summary, February 1960, 7 pp. (Market News Service, U. S. Fish and Wildlife Service, Pier 42 So., Seattle 4, Wash.) Includes landings and local receipts, with ex-vessel and wholesale prices in some instances, as reported by Seattle and Astoria (Ore.) wholesale dealers; also Northwest Pacific halibut landings; and Washington shrimp landings; for the month indicated.

The Size and Shape of Metamorphosing Larvae of Venus (MERCENARIA) Mercenaria Grown at Different Temperatures, by Victor L. Loosanoff, 11 pp., illus., printed. (Reprinted from Biological Bulletin, vol. 117, no. 2, October 1959, pp. 308-318.) Bureau of Commercial Fisheries, Biological Laboratory, Milford, Conn.

THE FOLLOWING MARKET NEWS LEAFLETS ARE AVAILABLE FROM THE BRANCH OF MARKET NEWS, BUREAU OF COMMERCIAL FISHERIES, U. S. FISH AND WILDLIFE SERVICE, WASHINGTON 25, D. C.

Number	Title
MNL-12	Peruvian Fisheries, 1959.
MNL-14	United Kingdom's Fishing Industry, 1958-1959.
MNL-15	Japanese Trawling Operations in the Bering Sea.

THE FOLLOWING ENGLISH TRANSLATION OF A FOREIGN LANGUAGE ARTICLE IS AVAILABLE ONLY FROM THE U. S. FISH AND WILDLIFE SERVICE, BUREAU OF COMMERCIAL FISHERIES, P. O. BOX 3830, HONOLULU, HAWAII.

Attempts at Estimating the Abundance of Fish Population from the Data of Tuna Long Line Fishery. II--A Few Considerations on the Size of

Stratum, by Akira Suda, 11 pp., processed. (Translated from Nankai Regional Fisheries Research Laboratory, Report no. 7, February 1958, pp. 127-148.)

THE FOLLOWING SERVICE PUBLICATIONS ARE FOR SALE AND ARE AVAILABLE ONLY FROM THE SUPERINTENDENT OF DOCUMENTS, WASHINGTON 25, D. C.

1959 Annual Report of the Secretary of the Interior (For the Fiscal Year Ended June 30, 1959), 522 pp., illus., printed, $3. U. S. Department of the Interior, Washington, D. C. The activities of the Department's bureaus and offices, including the United States Fish and Wildlife Service, are summarized in this report. Among others, the activities of the Bureau of Commercial Fisheries are described. Activities discussed in detail are utilization of the commercial fishery resources; research in fishery biology (shellfisheries, anadromous, inland, and marine fisheries); conservation of Alaska commercial fisheries; Columbia River fisheries program; and Pribilof Island Fur-Seal industry. A summary of the various activities of the Bureau of Sport Fisheries and Wildlife is also included.

Public Fish Culture in the United States, 1958 (A Statistical Summary), by William Hagen and Joseph O. O.'Connor, Circular 58, 47 pp., illus., processed, 35 cents, October 1959. A report summarizing the statistical data gathered from the third survey of state fish cultural activities conducted by the U. S. Bureau of Sport Fisheries and Wildlife. The previous surveys were carried out in 1937 and 1949. Basic tool in the present study was a questionnaire sent to all 50 states, requesting data on various aspects of their hatchery facilities and operations, including even an estimate of the expected fish requirements in 1970. This report includes tables showing distribution of fish, by species, from state hatcheries; distribution from Bureau hatcheries, 1957; fish food purchased by the states and the Bureau, 1948 and 1958; hatchery and fishery research and management by the states and Bureau, 1948 and 1958; and other pertinent data. Includes also a number of excellent photos of hatcheries.

MISCELLANEOUS PUBLICATIONS

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM. CORRESPONDENCE REGARDING PUBLICATIONS THAT FOLLOW SHOULD BE ADDRESSED TO THE RESPECTIVE ORGANIZATION OR PUBLISHER MENTIONED. DATA ON PRICES, IF READILY AVAILABLE, ARE SHOWN.

ALGAE:

"Complex Primitives: The Red Alga Group," by I. MacKenzie Lamb, article, Natural History, vol. 69, no. 3, March 1960, pp. 16-25, illus., printed, single copy 50 cents. The American Museum of Natural History, Central Park West at 79th St., New York 24, N. Y.

ALMANAC:

The American Ephemeris and Nautical Almanac for the Year 1961, 523 pp., printed, $4. U. S. Naval Observatory, Nautical Almanac Office, Washington, D. C. (For sale by Superintendent of Documents, Government Printing Office, Washington 25, D. C.)

ANCHOVY:

"The Food of the Larvae of the Northern Anchovy Engraulis mordax," by Leo Berner, Jr., article, Inter-American Tropical Tuna Commission Bulletin, vol. 4, no. 1, 1959, pp. 1-22, illus., printed in English and Spanish. Inter-American Tropical Tuna Commission, La Jolla, Calif.

"Identification of the Egg, Early Life History and Spawning Areas of the Anchoveta, Cetengraulis mysticetus (Gunther), in the Gulf of Panama," by John G. Simpson, article, Inter-American Tropical Tuna Commission Bulletin, vol. 3, no. 10, 1959, pp. 441-580, illus., printed in English and Spanish. Inter-American Tropical Tuna Commission, La Jolla, Calif.

ANGOLA:

V Congresso Nacional de Pesca, Angola 1958 - Resumos dos Trabalhos Apresentados (Fifth National Fishery Congress, Angola 1958 - Summaries of Papers Presented), 372 pp., processed in Portuguese. Gabinete de Estudos das Pescas, Lisbon, Portugal. Includes summaries of the 96 papers presented at the Fifth National Fishery Congress, Luanda, Angola, October 1958.

ARGENTINA:

La Pesca Maritima en el Pais (The Marine Fishery of the Country), by Armando Benjamin Sangiorgio, 47 pp., illus., printed in Spanish. Direccion General de Pesca, Secretario de Estado de Agricultura y Ganaderia de la Nacion, Buenos Aires, Argentina, 1959. A comprehensive report covering past accomplishments in the development of the fisheries; conservation of the living resources of the sea; distribution of marine life; and the continental shelf. It also discusses the present status of the fisheries; the high seas and coastal fisheries; marine algae; laws and enforcement; and world fishery production. Included are many statistical tables showing catch by areas and species, vessels by areas, and other pertinent data.

AUSTRALIA:

Australian Journal of Marine and Freshwater Research, vol. 10, no. 3, December 1959, 146 pp., illus., printed. Australian Journal of Marine and Freshwater Research, Commonwealth Scientific and Industrial Research Organization, 314 Albert St., East Melbourne, C2, Australia. Features, among others, articles on: "Some Aspects of the Ecology of Lake Macquarie, N.S.W., with Regard to an Alleged Depletion of Fish. VIII--Trends of the Commercial Fish Catch and Management of the Fishery;" "IX--The Fishes and Their Food;" "X--The Movement of Fish;" and "XI--Estimation of Fish Populations," by J. M. Thomson.

Fishing and Whaling, 1958-59, Statistical Bulletin no. 5, 20 pp., illus., processed. Commonwealth Bureau of Census and Statistics, Canberra, Australia. This is the fifth of a series of annual bulletins dealing with the fishing and whaling industries in Australia. The statistics, covering

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quantity and value of catch and related data, pertain to the year 1958/59 for fisheries and the 1959 season for whaling, with comparative data for the previous 4 years. The bulletin is divided into 4 parts. Part I deals with general fisheries including those for finfish, crustaceans, and molluscs. Part II includes fisheries for pearl-shell and trochus shell. Part III covers the operation of the whaling industry in Australia and Norfolk Island. Part IV shows particulars of overseas trade in fishery and whaling products.

A Review of the Victorian Fishing Industry, 87 pp., illus., processed. Fisheries and Game Dept., 605 Flinders St., Melbourne, C3, Australia. A concise and well-written report on the development and present status of the commercial fresh- and salt-water fisheries in the State of Victoria, Australia. Despite an extensive coastline, large stocks of fish are not readily available in Victorian waters. Since about 25 percent of the population of Australia inhabits this State which comprises only 3.3 percent of the land area, the demand on the fishery resources has been so great that importation of fish has been a necessity. Further development of deep-sea fisheries, such as that for yellow-eye mullet, Australian salmon, and tunas, and the fisheries in the inland lakes is suggested as a means of supplementing existing fish supplies. This report presents information on factors influencing or limiting Victorian fish production, expansion of the fisheries, imports, fishermen's cooperatives, canneries, sport fishing, and the functions of the Fisheries and Game Department.

BARNACLES:

The Settlement and Growth of BALANUS IMPROVISUS, B. EBURNEUS and B. AMPHITRITE, by H. B. Moore and A. C. Frue, 20 pp., illus., printed. (Reprinted from Bulletin of Marine Science of the Gulf and Caribbean, vol. 9, no. 4, pp. 421-440, December 1959.) The Marine Laboratory, University of Miami, Miami 49, Fla.

BEHAVIOR OF FISH:

"Izuchenie Povedeniya Ryb vo Vremya Lova" (A Study of the Behavior of Fish During Catching), by D. V. Radakov, article, Voprosy ikhtiologii, no. 6, 1956, pp. 37-46, printed in Russian. Voprosy Ikhtiologii, Akademia Nauk, U. S. S. R., Ikhtiologicheskaia Komissaia, Moscow, U. S. S. R.

"'Rech' Ryb" (The "Language" of Fish), by Yu. A. Shemanskiy, article, Nauka i Zhizn', no. 8, 1958, p. 42, printed in Russian. Nauka i Zhizn', Provda, Novaya Ploshchad', 4, Moscow K-12, U. S. S. R.

BROOK TROUT:

A Compendium of the Life History and Ecology of the Eastern Brook Trout SALVELINUS FONTINALIS (Mitchill), by Colton H. Bridges, Fisheries Bulletin No. 23, 30 pp., printed. Massachusetts Division of Fisheries and Game, 73 Tremont St., Boston 8, Mass., 1958.

CANADA:

Annual Report of the Fisheries Research Board of Canada, 1958/1959 (For the Fiscal Year Ended March 31, 1959), 186 pp., illus., printed in English with additional introduction in French. A comprehensive summary of the work of the Fisheries Research Board of Canada and its field stations during 1958/1959. The work of the Board is organized in three closely coordinated fields: biological, technological, and oceanographic. During 1958 the Board's new 177-foot trawler-type research vessel, the A. T. Cameron, was placed in service on the Atlantic Coast; biological laboratory facilities in St. Andrews, New Brunswick, were increased; a new technological laboratory was nearly completed in Vancouver, British Columbia; a rented business block in London, Ontario, was modified to serve as laboratory headquarters for fresh-water fishery research; and expanded laboratory space was provided in the Great Slave Lake area. The report also covers activities at the Biological Stations, St. John's, Newfoundland, and Nanaimo, British Columbia; the Arctic Unit, Montreal, Quebec; and the Technological Stations at Halifax, Nova Scotia, Grande-Rivera, Quebec, St. John's, Newfoundland, London, Ontario, and Vancouver, British Columbia. A list of the publications and reports published during the year by the Board is included.

Journal of the Fisheries Research Board of Canada, vol. 16, no. 6, December 1959, 189 pp., illus., printed. Queen's Printer and Controller of Stationery, Ottawa, Canada. Includes, among others, these articles: "Keeping Quality of Pacific Coast Dogfish," by R. H. Moyer and others; "Marine and Freshwater Fishes of the Miramichi River and Estuary, New Brunswick," by R. A. McKenzie; "Survival and Production of Pink and Chum Salmon in a Coastal Stream," by J. G. Hunter; "Additional Observations Concerning Residual Sockeye and Kokanee (Oncorhynchus nerka)," by W. E. Ricker; and "Some Morphological Differences Between the Subspecies of Cutthroat Trout, Salmo clarkii clarkii and Salmo clarkii lewisi, in British Columbia," by S. U. Qadri.

Journal of the Fisheries Research Board of Canada, vol. 17, no. 1, January 1960, 126 pp., illus., printed. Queen's Printer and Controller of Stationery, Ottawa, Canada. Contains, among others, these articles: "The Effect of Time and Temperature of Cooking on the Palatability and Cooking Losses of Frozen Atlantic Codfish Fillets," by Iva L. Armstrong and others; "Incidence and Distribution of Infestation by Sphyrion lumpi (Krøyer) on the Redfish, Sebastes marinus (L.), of the Western North Atlantic," by Wilfred Templeman and H. J. Squires; "Estimating Abundance from Longline Catches," by Garth I. Murphy; "The Growth, Length-Weight Relationship, and Maturity of Haddock (Melanogrammus aeglefinus L.) from the Region of Lockeport, N.S.," by A. C. Kohler; "Biochemical Studies on Sockeye Salmon During Spawning Migration. IX--Fat, Protein and Water in the Major Internal Organs and Cholesterol in the Liver and Gonads of the Standard Fish," by D. R. Idler and I. Bitners; and "Biochemical Studies on Sockeye Salmon During Spawning Migration. X--Glucose, Total Protein, Non-Protein Nitrogen and Amino Acid Nitrogen in Plasma," by R. E. E. Jonas and R. A. MacLeod.

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CATFISH:

"Propagation of Channel Catfish (Ictalurus lacustris) at State Fish Hatchery," by Bruce Crawford, paper, Proceedings of the Eleventh Annual Conference, Southeastern Association of Game and Fish Commissioners, October 20-23, 1957, pp. 132-141, printed. Southeastern Association of Game and Fish Commissioners, Columbia, S. C., 1958.

COD:

"La Flotte Morutière Portugaise Devra Ralentir son Expansion Après 1964" (The Portuguese Codfishing Fleet Must Slow Down its Expansion Before 1964), article, La Peche Maritime, vol. 39, no. 983, February 1960, pp. 73-74, illus., printed in French. La Peche Maritime, 190 Boulevard Haussmann, Paris (8e), France.

COMMISSIONS:

(Atlantic States Marine Fisheries Commission) Eighteenth Annual Report (to the Congress of the United States and to the Governors and Legislators of the Fifteen Compacting States), 54 pp., printed. Atlantic States Marine Fisheries Commission, 22 W. First St., Mount Vernon, N. Y., February 1960. Summarizes briefly the many activities of the Atlantic States Marine Fisheries Commission during 1959. Includes condensed reports of the work of the Commission and of the basic committees--legal, technological, biological, and executive. Discusses a report entitled "Recommendations by the Bureau of Commercial Fisheries as to What is Needed in Each State to Establish an Effective System of Catch Statistics," submitted in answer to a formal request made at the 17th Annual Meeting of the Commission. Also contains reports from the North Atlantic Section on the oyster crisis in Long Island Sound, the shad project, and clam investigations. The Middle Atlantic Section reports on dams and barriers on the Delaware River, marshlands protection, and decline of the croaker and sea trout fishery. The Chesapeake Bay Section discusses oyster mortalities, the Potomac Compact between Maryland and Virginia, fisheries of the Atlantic Bight, shad and blue crab projects, cooperative striped bass project, and Baltimore Harbor pollution problem. The South Atlantic Section reports on South Carolina's requirements concerning out-of-state licenses, disposition of marshlands, shad and blue crab projects, exploratory fishing for scallops and shrimp, and legislation for limitation of shrimp imports. Appendices include State legislation recommended, proposed inclusion of mollusks in the terms of the International Convention for the Northwest Atlantic Fisheries, and resolutions adopted by the Commission.

(Atlantic States Marine Fisheries Commission) Minutes of the 18th Annual Meeting (September 22-24, 1959, New York, N. Y.) 219 pp., processed, limited distribution. Atlantic States Marine Fisheries Commission, 22 W. First St., Mount Vernon, N. Y. Covers the minutes of the 18th Annual Meeting of the Commission with details of attendance; the first, second, and third general sessions; and section meetings of the North Atlantic, Middle Atlantic, Chesapeake Bay, and South Atlantic Sections. Also includes accounts of the individual section meetings, resolutions recommended for adoption, and the executive committee meeting. Appendices include, among others, reports on research work accomplished by the Commission and its sponsoring agency, the U. S. Fish and Wildlife Service. Also included in the appendices are recommendations by the Bureau of Commercial Fisheries as to what is needed in each State to establish an effective system of catch statistics; and reports on increased consumption of fishery products through quality improvement; use made of Payne Act funds for fishery education and extent of State participation; disposal of radioactive wastes in the sea; and new approach in relations between angler groups and commercial fishery groups.

Gulf States Marine Fisheries Commission Tenth Annual Report 1958-1959 (to the Congress of the United States and to the Governors and Legislators of Alabama, Florida, Louisiana, Mississippi, and Texas), 38 pp., printed, for limited distribution. Gulf States Marine Fisheries Commission, 312 Audubon Bldg., New Orleans 16, La., February 1960. Outlines the Commission's activities for the period October 1958-October 1959, with a summary of some of the points of general interest in the Compact among the 5 Gulf States. Describes briefly the activities of each of those States during the period. Short discussions of the U. S. Fish and Wildlife Service activities in technological and biological research, exploratory fishing in the Gulf area, the Gulf fishery statistical and Market News program, and other activities are included. Also contains a financial report of the Commission.

CRABS:

The Shallow-Water Hermit Crabs of Florida, by Anthony J. Provenzano, Jr., 71 pp., illus., printed. (Reprinted from Bulletin of Marine Science of the Gulf and Caribbean, vol. 9, no. 4, December 1959, pp. 349-420.) The Marine Laboratory, University of Miami, 1 Rickenbacker Causeway, Miami 49, Fla.

DENMARK:

"La Industria Danesa de Congelacion de Filetes de Pescado" (The Danish Fish Fillet Freezing Industry), by Henning Pedersen, article, Industrias Pesqueras, vol. 33, no. 784, December 15, 1959, pp. 427-428, printed in Spanish. Industrias Pesqueras, Policarpo Sanz, 21-2°, Vigo, Spain. A translation of an article appearing in Danish Foreign Office Journal. Describes the enormous increase in the export of fish fillets from Denmark since World War II and a major factor in this increase, the development of freezing on a commercially-profitable basis. The advantages to the consumer of frozen fish fillets are discussed. The Danish industry utilizes two techniques for this process: the machine method, usually used for "round" fish, especially cod; and the hand-cutting method, used for preparing groundfish fillets. Mentions research in new techniques and the development of the Greenland fisheries. Greenland exports large quanti-

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ties of fillets to the United States. Between 1954 and 1958, the quantity and value of Danish exports of fish fillets more than doubled.

EAST AFRICA:
Lake Victoria Fisheries Service, Annual Report, 1958/59, 32 pp., illus., printed. East African High Commission, Nairobi, Kenya, 1959. Reports on the general activities of the Lake Victoria Fisheries Service, including studies on motor fishing vessels, radio equipment, random-sample recording, improved fishing boats, deep-water fishing survey, fish meal, use of gill nets, introduction of tilapia into Lake Victoria, fish marking, legal enforcement, and survey of fishing activity. Also includes statistical summaries of annual catches by species in 1958 at recording stations in Uganda, Tanganyika, and Kenya, which are the three territories under the authority of the East African High Commission.

ECHO-SOUNDING:
Echo Sounding Experiments in the Barents Sea, by I. D. Richardson and others, Fishery Investigations, series II, vol. XXII, no. 9, 61 pp., illus., printed, £1 (about US$2.80). York House, Kingsway, London WC2, England, 1959.

"Locating Fish With Echo Sounder (A Report on the White Line Recorder, the Operation of the Echo Sounder, and Interpretation of the Echograms)," by Ralph Eide, Norwegian Fishing News, vol. 6, no. 4, 1959, pp. 15, 17, 19, 21, 23, illus., printed. Norwegian Fishing News, Ltd., Bergen, Norway.

ECOLOGY:
Eksperimental'naia Ekologiia Pitaniia Ryb (Experimental Ecology of Fish-Feeding), by Viktor Sergeevich Ivlev, 252 pp., illus., printed in Russian. Pishchepromizdat (Food Industry Publishing House), Moscow, U. S. S. R., 1955.

EUROPEAN COMMON MARKET:
"L'Economie des Pêches Françaises Apres un An de Marché Commun" (The Economics of the French Fisheries after One Year of the Common Market), by J. Merot, article, La Pêche Maritime, vol. 38, no. 981, December 1959, pp. 755-762, illus., printed in French. La Peche Maritime, 190 Boulevard Hausmann, Paris (8e), France.

"Situation et Evolution de la Pêche Maritime Italienne dans le Cadre du Marché Commun" (The Status and Growth of the Italian Marine Fishery Within the Framework of the Common Market), by C. de Felip, article, La Pêche Maritime, vol. 38, no. 981, December 1959, pp. 776-779, illus., printed in French. La Peche Maritime, 190 Boulevard Haussmann, Paris (8e), France.

FISH-LIVER OILS:
"A Substance in Lingcod Liver Oil Which Prevents Hypercholesterolaemia in Cholesterol-Fed Chickens," by J. D. Wood and Jacob Biely, article, Nature, vol. 185, no. 4711, February 13, 1960, pp. 473-474, printed. Nature, St. Martin's Press, 175 Fifth Ave., New York 10, N. Y.

FISHERIES MANAGEMENT:
Biological and Economic Aspects of the Management of Commercial Marine Fisheries, by Milner B. Schaefer, 5 pp., illus., printed. (Reprinted from Transactions of the American Fisheries Society, vol. 88, 1959, pp. 100-104.) Inter-American Tropical Tuna Commission, La Jolla, Calif., 1959.

"Program of the Branch of Fishery Management Services," by Willis King, paper, Proceedings of the Eleventh Annual Conference, Southeastern Association of Game and Fish Commissioners, October 20-23, 1957, pp. 62-66, printed. Southeastern Association of Game and Fish Commissioners, Columbia, S. C., 1958. The legal authority and objectives for this new Branch of the Bureau of Sport Fisheries and Wildlife, U. S. Fish and Wildlife Service, are discussed. Management services on Federal lands, cooperation on State fishery programs, and plans for new activities are covered.

FISHERY RESEARCH:
"Some Uses of Punch Card Methods in the Tabulation and Analysis of Fishery Research Data," by Ben Leeper, Herbert Stern, Jr., and Victor M. Lambou, paper, Proceedings of the Eleventh Annual Conference, Southeastern Association of Game and Fish Commissioners, October 20-23, 1957, pp. 226-232, printed. Southeastern Association of Game and Fish Commissioners, Columbia, S. C., 1958.

FLORIDA:
An Ecological Study of the Fishes of the Tampa Bay Area, by Victor G. Springer and Kenneth D. Woodburn, Professional Papers Series no. 1, 109 pp., illus., printed. Florida State Board of Conservation, Marine Laboratory, St. Petersburg, Fla., January 1960.

FROZEN FISH:
"La Commercialisation et la Consommation du Poisson Congelé dans le Pays Membres de l'O. E. C. E." (The Marketing and Consumption of Frozen Fish in the Member Countries of the O. E. E. C.), article, La Pêche Maritime, vol. 38, no. 981, December 1959, pp. 792-803, illus., printed in French. La Peche Maritime, 190 Boulevard Hausmann, Paris (8e), France.

GENERAL:
Fish and Ships (This Was Fishing from the Columbia to Bristol Bay), by Ralph W. Andrews and A. K. Larssen, 250 pp. of photos with short text, printed, $10.60. The Fishermen's News, Fishermen's Terminal, Seattle 99, Wash. A picture history of the old days of cod, halibut, and salmon in the Pacific Northwest. It covers Indian customs, gill-netting under sail, horse and beach seining, early salteries and canneries, whaling, and sealing.

GILL NETS:
"Comparative Efficiency of Differently Coloured Gill-Net in the North Sea Salmon Fishing," by Atushi Koike, article, Bulletin of the Japanese Society of Scientific Fisheries, vol. 24, no. 1, 1958, pp. 9-12, printed in Japanese with English

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abstract. Japanese Society of Scientific Fisheries, c/o Tokyo Suisan Daigaku, Shiba-kaigandori 6-Chome, Tokyo, Japan.

HERRING:

The Extent of the 1959 Herring Spawning in British Columbia Coastal Waters, by D. N. Outram, Circular No. 56, 13 pp., illus., processed. Fisheries Research Board of Canada, Biological Station, Nanaimo B. C., Canada, November 1959. Reviews the annual success of herring spawning in the major British Columbia herring stocks. Since the amount of spawn deposited in any region is proportional to the number of spawners, the annual estimates of spawn deposition not only form a basis for a quantitative index of the size of the spawning stock but also provide an indication of the escapement from the fishery and hence of the carry-over to the next fishing season. The present report covers the results of the 1959 spawn census in 12 areas along the British Columbia coast. In spite of the second largest winter catch on record, the size of the 1959 spawning escapements showed an increase from the previous year in all but 3 subdistricts. This terminated a steady, downward trend apparent during the past 6 years in the total amount of spawn deposited.

"Nablyudeniya za Povedeniem Kaspyskikh Kilek" (Observations on the Behavior of the Caspian Sprat), by I. V. Nikonorov, article, Voprosy Ikhtiologii, no. 6, 1956, pp. 21-36, printed in Russian. Voprosy Ikhtiologii, Akademia Nauk, U. S. S. R., Ikhtiologicheskaia Komissaia, Moscow, U. S. S. R. In this investigation, the behavior of sprats was studied to perfect methods of catching them by the use of light.

"Smasild- og Feitsildtokt Med G. O. Sars i Tiden 24. September til 29. Oktober 1959" (Small Herring and Fat Herring Investigations by Research Vessel G. O. Sars Between September 24 and October 29, 1959), by Olav Dragesund, article, Fiskets Gang, vol. 45, no. 52, December 24, 1959, pp. 694-699, illus., printed in Norwegian. Fiskets Gang, Postgiro Nr. 691 81, Bergen, Norway.

IMPORTS:

Schedule A--Statistical Classification of Commodities Imported into the United States, January 1, 1960, Edition, 268 pp., printed, $3.50 domestic and $4.50 foreign. (The cost of the Schedule includes supplemental bulletins and pages to keep it up to date for at least a year from the time of issuance.) Foreign Trade Division, Bureau of the Census, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) This Schedule exhibits the statistical commodity classifications (including fishery products and related commodities) used in compiling the official United States import statistics. It shows the complete commodity description and commodity code number for each statistical classification used in the published reports and machine tabulations of United States imports. In addition, it shows the country, customs district, commodity subgroup, commodity group, economic class, and flag of vessel classifications, as well as the units of quantities used in the compilation of the data.

IRRADIATION PRESERVATION:

"Cuts Food Radiation Costs," article, Food Engineering, vol. 32, no. 1, January 1960, pp. 78-80, illus., printed. Food Engineering, McGraw-Hill Publishing Co., Inc., 330 W. 42nd St., New York 36, N. Y. Capital investment can be halved and operating charges reduced 75 percent in processing foods by the use of a new radiation generator, the L-band linac (traveling-wave linear accelerator). "Shelf-life extension of seafood by low dose irradiation presents an opportunity to reverse the declining trend of the fresh fish market," according to the author. In this type of processing, "one L-band linac will handle 9,200 lbs. per hr. at 250,000 rad. Previously, two conventional S-band linacs would have been required to handle 7,500 lbs. per hr., at more than twice the capital cost."

JAPAN:

Bulletin of the Japanese Society of Scientific Fisheries, vol. 25, nos. 7-9, November 1959, 97 pp., illus., printed in Japanese with English summaries. Japanese Society of Scientific Fisheries, c/o Tokyo University of Fisheries, Shiba-kaigandori 6-Chome, Minato-ku, Tokyo, Japan. Contains, among others, these articles: "Implication of the Scale Ring. III--Improvement of Age-Determination for Fishes," by Hideaki Yasuda; "The Comparison of Sardine Purse Seine Fishery Between Ohara and Katagai in Chiba Prefecture (Significance of Fishery Harbour Reflected in the Attainment of Sardine Purse Seine Fishery)," by Makoto Inoue; "The Distribution of Stress on the Fishing Net. I--On the Statical Load," by Yasushi Kondo and Makoto Suzuki; "The Cooperation of Some Legalized Antiseptics in Their Preservative Application to Fish Cakes," by Megumu Goda and Yoshinobu Isa; "The Softening Spoilage of Fish Sausage. V--Effect of Sodium Pyrophosphate and Sorbic Acid on the Growth of Spore of Bacillus circulans," by Hitoshi Uchiyama and Keishi Amano; "Bacteriological Studies on the Spoilage of Fish Sausage. I--Number of Bacteria Present in the Meat of Fish Sausage on the Market," by Mikio Akamatsu; "Bacteriological Studies on the Spoilage of Fish Sausage. II--Kinds of Bacteria Present in the Meat of Fish Sausage on the Market," by Mikio Akamatsu; "Bacteriological Studies on the Spoilage of Fish Sausage. III--Aerobic and Anaerobic Growth of Three Kinds of Bacillus Which are Isolated from Fish Sausage," by Mikio Akamatsu; and "The δ-Radiation Oil Deterioration of Marine Products and Its Prevention (Preliminary Work)," by Kenzo Toyama, Toshiyuki Hirano and Hiroshi Yamaga.

Bulletin of the Japanese Society of Scientific Fisheries, vol. 25, nos. 10-12, December 1959, 108 pp., illus., printed in Japanese with English abstracts. Japanese Society of Scientific Fisheries, c/o Tokyo University of Fisheries, Shiba-kaigandori 6-Chome, Minato-ku, Tokyo, Japan. Includes, among others, the following articles: "Preparation of a Coating Material by Chlorination of Fish Oil. VI--Influence of Hydroxy Groups

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and Peroxides in Fish Oil on Chlorination," by Kosaku Suzuki; "Amino Acid Composition of the Muscle Extracts of Aquatic Animals. II--The Amounts of Free Amino Acids in the Muscle of Shellfishes and Their Variation During Spoilage," by Keiji Ito; "Biochemical Studies on the Edible Seaweed, Porphyra tenera. I--Contents of Various Nitrogenous Components in the Frond as Affected by the Type of the Nitrogen Source," by Shiro Sato and others; and "Riboflavin Contents in the Liver of Fish," by Hideo Higashi, Shigeo Murayama, and Kikuko Tabei.

LIGHT FISHING:

"Reaktsiya Ryb na Tsvet" (The Reaction of Fish to Light), by T. I. Privol'nev, article, Voprosy Ikhtiologii, no. 6, 1956, pp. 3-20, printed in Russian. Voprosy Ikhtiologii, Akademia Nauk, U. S. S. R., Ikhtiologicheskaia Komissaia, Moscow, U. S. S. R.

MARINE BIOLOGY:

Some Information of the Basic Studies on Marine Biology in Japan, by Denzaburo Miyadi, Contributions from the Seto Marine Biological Laboratory, No. 306, 7 pp., illus., printed. (Reprinted from Proceedings of the UNESCO, Symposium on Physical Oceanography, 1955, pp. 197-203.) UNESCO, Paris and Japan Society for the Promotion of Science, Tokyo, Japan, 1957.

NETS:

"The Selectivity and Effectiveness of Certain Types of Commercial Nets in the T. V. A. Lakes of Alabama," by C. E. White, Jr., paper, Proceedings of the Eleventh Annual Conference, Southeastern Association of Game and Fish Commissioners, October 20-23, 1957, pp. 142-151, printed. Southeastern Association of Game and Fish Commissioners, Columbia, S. C., 1958.

NORTH PACIFIC FISHERIES COMMISSION:

(International North Pacific Fisheries Commission) Proceedings of the Sixth Annual Meeting, 1959 (Seattle, Wash., November 2-7, 1959), 152 pp., processed. International North Pacific Fisheries Commission, University of British Columbia, Vancouver 8, B. C., Canada, February 1960. Covers the agenda, list of participants, minutes of sessions, and committee reports for the sixth annual meeting of the Commission. The appendixes present, among others, subcommittee reports on distribution of sockeye, pink, and chum salmon; results of deep-sea salmon tagging; racial studies, statistics, and sampling; oceanographic studies; king crab research; and long-term research planning by the member countries--United States, Canada, and Japan.

NORTHWEST ATLANTIC FISHERIES COMMISSION:

Selected Reports of the Standing Committee on Research and Statistics (from the 1958 and 1956 Annual Meetings), 68 pp., illus., processed, limited distribution. (Reprints from serial numbers 570, 540, 553, and 413B.) International Commission for the Northwest Atlantic Fisheries, Halifax, N. S., Canada, 1958. Includes the complete report of the Committee on Research and Statistics at the 1958 and 1956 Annual Meetings together with appendixes. Presents reports of ad hoc subcommittees on requirements for the ocean perch symposium; marking; research on the sea scallop fishery of Subarea 5; statistics; chafing gear; assessment of benefits of mesh regulation; plankton and hydrography; sampling of Eastern Subarea 4 cod stocks; and others. Also presents an outline of present research and long-range needs in the Convention Area in regard to cod, haddock, ocean perch, halibut, statistics, sampling and population dynamics, standardization of measurements, gear selection and mesh measuring, and special projects.

NORWAY:

Cooperation Among Fishermen in Norway, Fiskeridirektoratets Skrifter, vol. IV, no. 2, 71 pp., illus., printed. A/S John Griegs Boktrykkeri, Bergen, Norway, 1959. Contains the following articles which were the basis for working papers presented at the FAO-ILO Technical Meeting on Fishery Cooperatives at Naples, May 12-21, 1959: "Business Organization and Management of Fishery Cooperatives in Norway," by Arne Nordset; and "A General Survey of the Development of Cooperation Among Fishermen in Norway and Methods by Which the Government Has Assisted the Organization," by Aslak Aasbø.

"Lofotfiskets Lonnsomhet 1959" (The Value of the Lofoten Fisheries in 1959), by Georg Oppendal, article, Fiskets Gang, vol. 46, no. 1, January 7, 1960, pp. 6-16, illus., printed in Norwegian. Fiskets Gang, Postgiro Nr. 691 81, Bergen, Norway.

"Rapport om Tokt med Johan Hjort til Barentshavet 19 September til 24 Oktober 1959" (Report on the Trip of the Johan Hjort to Barentshavet, September 19 to October 24, 1959), by Lars Midttun, article, Fiskets Gang, vol. 45, no. 47, November 19, 1959, pp. 639-640, illus., printed in Norwegian. Fiskets Gang, Postgiro Nr. 691 81, Bergen, Norway.

"Stortralernes Fiske i 1958" (Large Trawler Fishery in 1958), by Sverre Mollestad, article, Fiskets Gang, vol. 45, no. 48, November 26, 1959, pp. 650-656, illus., printed in Norwegian. Fiskets Gang, Postgiro Nr. 691 81, Bergen, Norway.

"Stortralernes Lønnsomhet 1958" (The Value of Large Trawlers during 1958), by A. Holm, article, Fiskets Gang, vol. 46, no. 2, January 14, 1960, pp. 24-30, illus., printed in Norwegian. Fiskets Gang, Postgiro Nr. 691 81, Bergen, Norway.

OCEANOGRAPHY:

"Canadian Oceanographic Research in the North Pacific Ocean," by J. P. Tully and A. J. Dodimead, 30 pp., printed. Fisheries Research Board of Canada, Pacific Oceanographic Group, Nanaimo, B. C., Canada, 1957.

PERU:

"Peru Rides a Fish Boom," by W. J. Jenkins, article, Foreign Trade, vol. 113, no. 5, February 27, 1960, pp. 18-20, illus., printed. Queen's

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

Printer, Government Printing Bureau, Ottawa, Canada, single copy 20 Canadian cents. Discusses the recent tremendous increase in the production of Peruvian fish meal and its consequences. Whaling and the bonito fishery are also sizable industries. "Borne along on the rich harvest of the Humboldt Current, Peru's fisheries still hold first place among the countries of Latin America. Expanding fleets require up-to-date equipment. . . .," explains the author.

PICKEREL:

A Compendium of the Life History and Ecology of the Chain Pickerel ESOX NIGER (LeSueur), by Kenneth Wich, Fisheries Bulletin No. 22, 23 pp., printed. Massachusetts Division of Fisheries and Game, 73 Tremont St., Boston 8, Mass., 1958.

POLLUTION:

"Sources and Control of Radioactive Water Pollutants," by E. C. Tsivoglou and W. W. Towne, article, Sewage and Industrial Wastes, vol. 29, no. 2, 1957, pp. 143-156, printed. Federation of Sewage and Industrial Wastes Association, 4435 Wisconsin Ave., NW., Washington 16, D. C.

POND FISHERIES:

"A Preliminary Report on the Comparative Testing of Some of the Newer Herbicides," by J. R. Snow, paper, Proceedings of the Eleventh Annual Conference, Southeastern Association of Game and Fish Commissioners, October 20-23, 1957, pp. 125-132, printed. Southeastern Association of Game and Fish Commissioners, Columbia, S. C., 1958.

PROCESSING:

"Enzyme Visceration and Scaling of Fish," by W. W. Meinke, article, Frosted Food Field, vol. 30, no. 2, February 1960, pp. 52, 66, illus., printed. Frosted Food Field, Inc., 321 Broadway, New York 7, N. Y. In this study, findings indicate the feasibility of producing a clean wholesome fish product for human consumption from fish by an enzymatic visceration and cleaning process. The enzyme for the process must have the ability to degrade or breakdown protein structure. Favorable economic return can be obtained from this operation only if the cleaned fish can bring a premium price. Different species of fish vary in the ease with which the viscera and scales can be removed by enzymatic preparations. In the present study, the golden croaker was used.

PROCESSING MACHINERY:

"Fish-Processing Machines For Factory-Trawlers and Factory-Ships" by I. A. Schenck, article, Norwegian Fishing News, vol. 6, no. 4, 1959, pp. 25, 27, 29, illus., printed. Norwegian Fishing News, Ltd., Bergen, Norway.

SALMON:

"Adult Returns of Pink Salmon from the 1954 Fraser River Planting," by W. Percy Wickett, article, Progress Reports of the Pacific Coast Stations, no. 111, 1958, pp. 18-19, printed. Fisheries Research Board of Canada, Pacific Fisheries Experimental Station, 6640 N. W. Marine Dr., Vancouver 8, B. C., Canada.

British Columbia Salmon Spawning Report - 1959, 14 pp., processed. Department of Fisheries, 1110 Georgia St., W., Vancouver, B. C., Canada, February 1960. Covers the developments associated with the 1959 salmon migration, seeding, and escapement in the various areas of British Columbia.

"Directing Young Salmon," article, Nature, vol. 182, no. 4629, 1958, pp. 162-163, printed. Nature, St. Martin's Press, Inc., 103 Park Ave., New York 17, N. Y.

"An International Tagging Test with Salmon (Salmo salar L.) Smolts," by A. Swain and P. E. Caradine, article, Nature, vol. 185, no. 4708, January 23, 1960, pp. 206-207, printed. Nature St. Martin's Press, Inc., 175 Fifth Ave., New York 10, N. Y.

"Neketorye Dannye o Morskikh Migratsiyakh Semgi" (Some Data on the Sea Migrations of Salmon), by V. V. Azbelev and I. I. Lagunov, article, Voprosy Ikhtiologii, no. 6, 1956, pp. 113-120, printed in Russian. Voprosy Ikhtiologii, Akademia Nauk, U. S. S. R., Ikhtiologicheskaia Komissaia, Moscow, U. S. S. R.

SHRIMP:

"Bacterial Content of Commercially Frozen Breaded Shrimp," by Rouben Kachikian, Edward P. Larken, and Warren Litsky, article, Frosted Food Field, vol. 30, no. 2, February 1960, pp. 50-51, printed. Frosted Food Field, Inc., 321 Broadway, New York 7, N. Y. A survey of 144 samples of commercially-frozen breaded shrimp (24 brands) indicated a high variation in the number and types of bacteria present. In the authors' opinion, consideration should be given each operation from fishing boat to the local market in an attempt to reduce the bacterial counts of the final product.

"Nutritive Value of Frozen Shrimp Offers Potent Promotion Prong," article, Quick Frozen Foods, vol. 22, no. 7, February 1960, pp. 125-126, 128, printed. Quick Frozen Foods, E. W. Williams, Publications, Inc., 82 Wall St., New York 5, N. Y. A provocative article describing the results of research on the biochemical composition and value in human nutrition of fresh and frozen shrimp. U. S. Department of the Interior's surveys predict an outstanding increase in the demand for shrimp during the next 15 years. The high value of shrimp, nutrition-wise, coupled with its abundance should be incentives for its increased consumption on a nationwide basis. The promotion of increased use of shrimp in the United States might be an alternative solution to the so-called oversupply problem to imposition of quotas or import duties by the Congress. Bills which would force such restrictions are now under consideration.

Results of Shrimp Trawling by INVESTIGATOR NO. 1, June 1959, by T. H. Butler, Circular No. 55, 7 pp., illus., processed. Fisheries Research Board of Canada, Biological Station, Nanaimo, B. C., Canada, November 1959. An extensive exploratory program for shrimp was conducted on the British Columbia coast from 1953 to 1955.

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A number of promising areas were located, and subsequently at least two were fished commercially. During June 1959, several inlets on the west coast of Vancouver Island and the area off the entrance to Nootka Sound were resurveyed. In all, 21 tows with a small otter trawl were completed. Details of all tows are presented in this report, which includes tables and maps of the areas studied.

SIERRA LEONE:
Report on Fisheries, 1958, 16 pp., printed, 1s. 6d. (about 21 U. S. cents). Government Bookshop, Water Street, Freetown, Sierra Leone, 1959. Reviews the accomplishments of the Fisheries Development and Research Unit of Sierra Leone since 1945. Also covers the work of the Development and Research Sections during 1958. A Fisheries Officer and Master Fisherman were appointed and commenced work on a four-point program including the (1) introduction of small inshore motor trawlers; (2) introduction of improved techniques to the indigenous fishery--outboard motors for canoes, etc.; (3) economic survey of the fishery including statistics and marketing and transportation methods; and (4) investigation of invertebrate fisheries such as shrimp, crayfish, and oysters. A program of research covering fish tagging, gear studies, and exploratory fishing was also initiated.

SOUTH CAROLINA:
Annual Report, 1958-1959, Contribution No. 31, 10 pp., illus., printed. (Reprinted from Report of South Carolina Wildlife Resources Department, Fiscal Year July 1, 1958-June 30, 1959.) Bears Bluff Laboratories, Wadmalaw Island, S. C., January 1960. A detailed description of the activities of Bears Bluff Laboratories for the period under review, covering the study of oysters, shrimp, blue crabs, finfish, pond cultivation.

SPINY LOBSTER:
"Le Conditionnement sous Vide des Queues de Langoustes en Haute Mer" (Vacuum Packing of Spiny Lobster Tails on the High Seas), by A. G. Bresson de Bast, article, France Pêche, vol. 4, no. 35, December 1959, pp. 19-20, illus., printed in French. France Peche, 84, Rue Carnot, Lorient, France.

ST. PIERRE AND MIQUELON:
"La Peche a Sant-Pierre et Miquelon" (The Fishery on St. Pierre and Miquelon), by R. Percier, article, La Pêche Maritime, vol. 39, no. 982, January 1960, pp. 13-18, illus., printed in French. La Peche Maritime, 190 Boulevard Haussmann, Paris (8e), France. Describes the fishing fleet, the harbors, fishing methods, species landed, processing plants, and other aspects of the fishing industry on these two tiny French possessions in Canada's Gulf of St. Lawrence.

STRIPED BASS:
"The Status of Striped Bass (Roccus saxatilis) (Walbaum) in North Carolina Waters," by Arthur W. Dickson, paper, Proceedings of the Eleventh Annual Conference, Southeastern Association of Game and Fish Commissioners, October 20-23, 1957, pp. 264-268, printed. Southeastern Association of Game and Fish Commissioners, Columbia, S. C., 1958.

"Striped Bass (Roccus saxatilis) (Walbaum) Research in Maryland," by Edwin M. Barry, paper, Proceedings of the Eleventh Annual Conference, Southeastern Association of Game and Fish Commissioners, October 20-23, 1957, pp. 268-270, printed. Southeastern Association of Game and Fish Commissioners, Columbia, S. C., 1958.

TILAPIA:
"Further Experiments with Tilapia mossambica as a Pondfish," by H. S. Swingle, paper, Proceedings of the Eleventh Annual Conference, Southeastern Association of Game and Fish Commissioners, October 20-23, 1957, pp. 152-154, printed. Southeastern Association of Game and Fish Commissioners, Columbia, S. C., 1958.

TOADFISH:
"Foghorn Sounds Beneath the Sea," by William N. Tavolga, article, Natural History, vol. 69, no. 3, March 1960, pp. 44-50, illus., printed, single copy 50 cents. The American Museum of Natural History, Central Park West at 79th St., New York 24, N. Y.

TRADE LIST:
The Bureau of Foreign Commerce, U. S. Department of Commerce, Washington 25, D. C., has published the following mimeographed trade list. Copies may be obtained by firms in the United States from that office or from Department of Commerce field offices at $2 each.

Canneries--Morocco, 11 pp. (February 1960). Lists the names of canneries and addresses and types of products handled. Includes fish and shellfish canneries.

TROUT:
Introduction of the Hybrid Between the Eastern Brook Trout and Lake Trout into the Great Lakes, by John Budd, 4 pp., illus., printed. (Reprinted from The Canadian Fish Culturist, no. 20, August 1957.) Department of Fisheries of Canada, Ottawa, Canada.

The Survival of Yearling Lake Trout Planted in South Bay, Lake Huron, by F. E. J. Fry and J. C. Budd, 9 pp., illus., printed. (Reprinted from The Canadian Fish Culturist, no. 23, December 1958.) Department of Fisheries of Canada, Ottawa, Canada.

TUNA:
Additional Information on the Length-Weight Relationship of Skipjack Tuna from the Eastern Tropical Pacific Ocean, by Richard C. Hennemuth, 13 pp., illus., printed in English and Spanish. (Reprinted from Inter-American Tropical Tuna Commission Bulletin, vol. 4, no. 2, 1959, pp. 25-37.) Inter-American Tropical Tuna Commission, La Jolla, Calif.

"Dakar, d'Une Campagne a l'Autre - La Campagne Thoniere 1958-1959" (Dakar, From One Season

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to Another - The Tuna Fishing Season, 1958-1959), by Jehan Ichtus, article, La Pêche Maritime, vol. 39, no. 983, February 1960, pp. 77-79, printed in French. La Peche Maritime, 190 Boulevard Haussmann, Paris (8e), France.

"Datos sobre la Edad y Crecimiento de la Albacora Germo alalunga Bonnaterre" (On the Age and Growth of the Albacore T. alalunga), by A. Figueras, article, Investigacion Pesquera, vol. 9, 1957, pp. 27-31, printed in Spanish. Instituto de Investigaciones Pesqueras, Universidad de Barcelona, Barcelona, Spain.

"Morphometric Comparison of Yellowfin Tuna for the Western, Middle, and Eastern Parts of the Indian Ocean," by Jun Nakagome, article, Bulletin of the Japanese Society of Scientific Fisheries, vol. 24, no. 3, 1958, pp. 165-168, printed in Japanese with English abstract. Japanese Society of Scientific Fisheries, c/o Tokyo Suisan Daigaku, Shiba-kaigandori 6-Chome, Tokyo, Japan.

Recovery of Tagged Bluefin Tuna (THUNNUS SALIENS), 3 pp., illus., printed. (Reprinted from California Fish and Game, vol. 46, no. 1, January 1960, pp. 107-109.) California Department of Fish and Game, 722 Capitol Ave., Sacramento 14, Calif.

"On the Seasonal Variation of Swimming Layers of Yellowfin Tuna, Big-Eyed Tuna, and Black Marlin in the Area of Caroline and Marshall Islands. II--Relation Between Seasonal Variation of Swimming Layer and Vertical Distribution of Water Temperature; III--On the Relationship Between Seasonal Variation of Swimming Layer and Rate-of-Catch," by Jun Nakagome, article, Bulletin of the Japanese Society of Scientific Fisheries, vol. 24, no. 3, 1958, pp. 169-175, printed in Japanese with English abstract. Japanese Society of Scientific Fisheries, c/o Tokyo Suisan Daigaku, Shiba-kaigandori 6-Chome, Tokyo, Japan.

"Tuna Fishing Investigations in the South Pacific," by Michel Angot, article, SPC Quarterly Bulletin, vol. 9, no. 4, October 1959, pp. 48-52, 60-62, illus., printed, single copy 30 U. S. cents. South Pacific Commission, Box 5254, G. P. O., Sydney, Australia. The commercial possibilities of tuna fishing in waters around French territories in the Pacific are promising, according to recent investigations made by fisheries research vessels of the French Institute of Oceania, Noumea, and Pacific Oceanic Fisheries Investigations, Honolulu. The revival of fishing, long neglected in this area, on a commercial scale utilizing modern methods is urged as a means of increasing the protein food supply, as well as an aid to the local economy.

UNITED KINGDOM:

Journal of the Marine Biological Association of the United Kingdom, vol. 38, no. 3, December 1959, 238 pp., illus., printed, $7.50. Journal of the Marine Biological Association, Cambridge University Press, 32 E. 57th St., New York 22, N. Y. Includes, among many others, these articles: "Observations on Herring Spawning and Larval Distribution in the Firth of Clyde in 1958," by B. B. Parrish and others; and "The Biology of the Prawn, Palaemon (=Leander) serratus (Pennant)," by G. R. Forster.

VIRGINIA:

Sixtieth and Sixty-First Annual Reports of the Commission of Fisheries of Virginia (For the Fiscal Years Ending June 30, 1958, and June 30, 1959), 57 pp., illus., printed. Commission of Fisheries, Newport News, Va., 1959. A report for the fiscal years ending June 30, 1958 and June 30, 1959, showing the amount of revenue derived from the fish and shellfish industries, all the expenditures, historical background and jurisdiction, and the general condition of the fish and shellfish industries under the supervision of the Commission. Self-explanatory schedules and reports for these fiscal years are included as follows: receipts from the fish and oyster industries; expenditures for administration, enforcement, and restocking work; recorded oyster planting grounds; areas in which restocking was done; and comparative statements of expenses for the past ten years. Includes reports covering the shad-hatching work on the Mattaponi and Pamunkey Rivers for 1958 and 1959. Because of poor runs of shad, the hatchery on the Chickahominy River did not operate during either year. A report of the Virginia Fisheries Laboratory, Gloucester Point, describes its activities for the two years, with special reference to investigations of oysters and oyster drills, the blue crab, migratory fish, and the pollution problem.

WHALING:

Whales and Whaling, by Paul Budker, 186 pp., illus., printed, 21s. (about US$2.94). George G. Harrap & Co., Ltd., London, England.

WHALING COMMISSION:

"The 11th Meeting of the International Whaling Commission," article, Norsk Hvalfangst-Tidende (The Norwegian Whaling Gazette), vol. 49, no. 1, January 1960, pp. 1-12, printed in Norwegian and English. Norsk Hvalfangst-Tidende, Sandefjord, Norway.

WHITE PERCH:

A Compendium of the Life History and Ecology of the White Perch MORONE AMERICANA (Gmelin), by Charles F. Tholts, III, Fisheries Bulletin No. 24, 16 pp., printed. Massachusetts Division of Fisheries and Game, 73 Tremont St., Boston 8, Mass., 1958.

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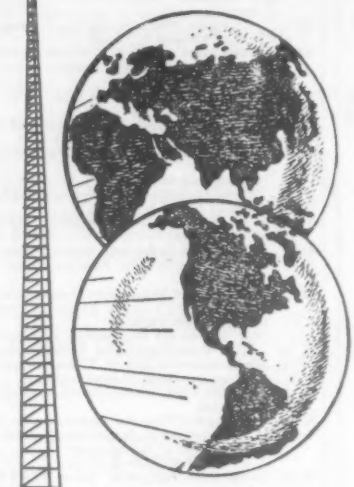

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